PB82-194564

Docket Analysis for the Final Noise Emission Regulation for Buses

(U.S.) Environmental Protection Agency
Washington, DC

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This document presents all comments received from the public regarding the proposed Bus Noise Emission Regulation and the Federal government's responses to each comment. The comments include those received during the 90-day public comment period and testimony received at two public hearings. The comments and Agency responses address: health and welfare benefits of the regulation; bus interior noise; school buses; possible economic effects of the regulation; noise control technology; enforcement of the regulation; test procedures; Acoustical Assurance Period and Sound Level Degradation Factor; Transbus; transit malls; and general comments. The document also lists: those organizations and individuals that commented during the 90-day public comment period or testified at the hearings; other organizations and individuals with which the Agency had contact during the development of the regulation; and those organizations and individuals that the Agency will contact in order to inform the public of the benefits and impacts of the regulation.

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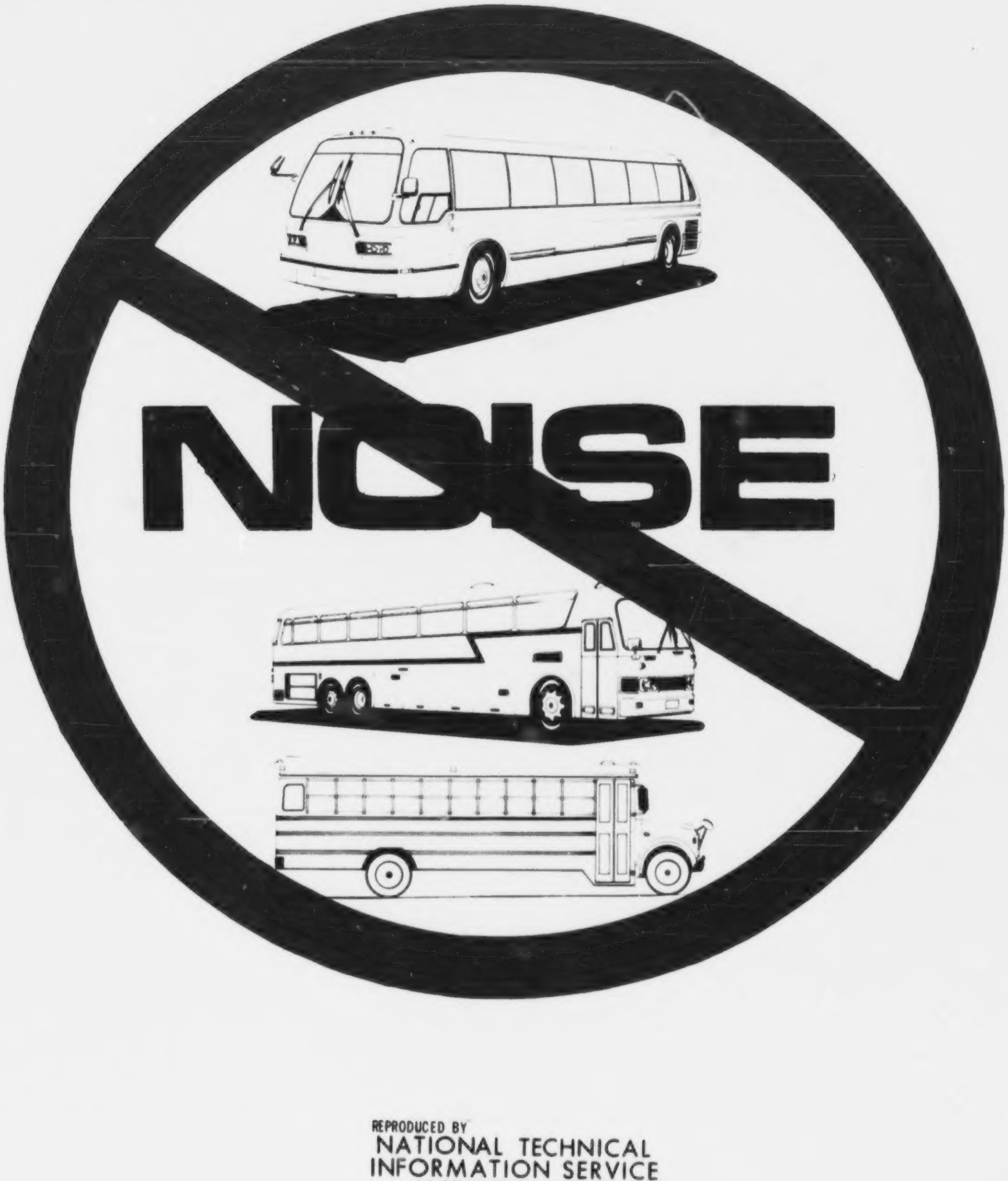

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DOCKET ANALYSIS
FOR THE FINAL NOISE EMISSION
REGULATION FOR BUSES

JULY 1980

U.S. ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF NOISE ABATEMENT AND CONTROL
WASHINGTON, D.C. 20460

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SECTION 1

INTRODUCTION

Through the Noise Control Act of 1972 (86 Stat. 1234), Congress established a national policy "to promote an environment for all Americans free from noise that jeopardizes their health and welfare." In pursuit of this policy, Congress stated in Section 2 of the Act that "while primary responsibility for control of noise rests with state and local governments, Federal action is essential to deal with major noise sources in commerce, control of which requires national uniformity of treatment."

As part of this essential Federal action, Section 5(b)(1) of the Act requires that the Administrator of the U.S. Environmental Protection Agency, after consultation with the appropriate Federal agencies, publish a report or series of reports "identifying products (or classes of products) which in his judgment are major sources of noise." Section 6(a)(1) of the Act requires the Administrator to publish proposed regulations for each product identified as a major source of noise, and for which, in his judgment, noise standards are feasible. Four categories of products are listed as potential candidates for regulation; one of these is transportation equipment.

It was under the authority of Section 5(b)(1) that the Administrator published the report on May 28, 1975 (40 FR 23105) that identified buses as a major source of noise, and under the requirements of Section 6(a)(1) that the Administrator published the Notice of Proposed Rulemaking on September 12, 1977 (42 FR 45775) to control the noise emissions of newly manufactured buses.

A ninety day public comment period was opened from September 12, 1977 until December 11, 1977 and hearings were held in Washington, D.C. on October 25, 1977 and in San Francisco, California on November 1, 1977. Numerous comments were received from many different segments of the public through written submittals and at public hearings, and through communications with industry associations, as well as by further testing and analysis.

All comments received by the EPA concerning the proposed regulation during the formal public comment period are reviewed and responded to in this analysis. Those persons or organizations contributing comments have been grouped into the following categories: (1) bus manufacturers, (2) manufacturers related to the bus industry, (3) associations, (4) bus users, (5) private citizens and citizens groups, (6) biomedical community, (7) State and local governments, and (8) Federal government. A list of the specific contributors in each of these categories is provided in Section 2 where each contributor has been given an identification number.

Sections 3 to 13 provide summaries of the issues raised in the comments received and the EPA responses to those issues. The issues have been grouped into general categories. Comments received in each category in Sections 3 to 13 are cross-referenced with the contributors listed in Section 2.

Throughout the development of this regulation (from the identification of buses as a major noise source in 1975 to the present time) an effort has been made to allow all groups, organizations, and individuals who have an interest in, or who may be directly affected by, bus noise emission standards, the opportunity to participate in the rulemaking process. This public participation effort has included meetings with bus operator groups; bus industry associations; bus body and chassis manufacturers; bus distributors; and concerned State, county, and city officials. Organizations and individuals who provided comments during the formal comment period are only a part of the total public with which EPA has had contact throughout the development of the regulation. The organizations and individuals contacted in the development of this regulation are detailed in the lists in Section 2 and Appendix A of this document.

Only submissions made to EPA during the formal comment period are responded to in this analysis. Submissions to EPA concerning the proposed regulation that were dated before or after the formal comment period have received consideration by EPA in the responses to the issues, but are not formally identified as submissions to the docket.

As another step in the Agency's continuing public participation program, an extensive effort is underway to inform the public of the benefits and impacts of the noise emission standards for buses. This effort will include direct mailings of information packets to the major groups affected by the regulation and briefings to selected groups. Appendix B to this document lists the groups that are to be contacted in this informative public participation effort.

SECTION 2

LIST OF CONTRIBUTORS

This section lists persons or organizations that contributed comments pertaining to the regulation during the formal comment period of September 12, 1977 through December 11, 1977. Following each contributor's name in parentheses are identification numbers of the submissions to the docket: numbers preceded by a "D" identify the docket number of written submissions to the docket; numbers preceded by "PHW" denote page numbers in the testimony presented at the Washington, D.C. public hearing; and numbers preceded by "PHSF" denote testimony presented at the San Francisco public hearings.

Under the heading "Comments" following each contributor's name, numbers are found identifying those areas in which each contributor made comments. These numbers correspond directly to the categories of comments in Sections 3 to 13 of this docket analysis.

2.1 BUS MANUFACTURERS

2.1.1 Airstream
(D-128)

Comments: 4.3

2.1.2 AM General Corporation
(D-136, D-182, D-160, D-069)

Comments: 3.2, 3.4, 3.6, 3.7, 6.4, 6.6, 7.4, 8.3, 9.1, 9.2, 9.3, 9.4, 9.5, 9.9, 10.1, 10.4, 13.9

2.1.3 Blue Bird Body Company
(D-185, PHW-202, D-170, D-193L, D-200L, D-106, D-165)

Comments: 5.1, 5.2, 8.3, 9.3

2.1.4 Chrysler Corporation
(D-176)

Comments: 8.8. 9.1, 10.1, 10.4, 13.5, 13.9

2.1.5 Eagle International (Trailways)
(D-191)

Comments: 6.8

2.1.6 Flxible Company/Rohr Industries
(D-109, D-171, D-107)

Comments: 6.2, 6.3, 7.2, 8.4, 8.7, 9.1, 9.2, 9.3, 10.4, 11.1, 13.2

2.1.7 Ford Motor Company
(D-135, D-144, D-160, D-181)

Comments: 3.2, 3.3, 3.4, 3.5, 4.1, 5.1, 7.1, 8.2, 8.3, 8.6, 8.7, 9.1, 9.2, 9.3, 9.4, 9.8, 9.9, 9.11, 10.3, 10.4, 10.6, 13.1, 13.8

2.1.8 General Motors Corporation
(D-44, D-61, D-180, PHW-99, D-160)

Comments: 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 5.1, 6.2, 6.6, 7.2, 7.4, 8.1, 8.3, 8.5, 8.7, 8.8, 9.2, 9.3, 10.1, 10.4, 10.7, 11.1, 11.2, 13.2

2.1.9 Hendrickson Manufacturing Company
(D-167)

Comments: 9.3, 10.4

2.1.10 International Harvester
(PHSF-356, D-160, D-174, D-137)

Comments: 3.2, 3.3, 3.4, 3.5, 3.6, 4.1, 5.1, 5.4, 6.5, 7.1, 8.8, 9.3, 9.4, 10.1, 10.3, 10.4, 13.1, 13.2, 13.8

2.1.11 Mercedes Benz of North America
(D-187)

Comments: 4.4, 9.1, 9.4

2.1.12 Motor Coach Industries (MCI)
(Includes MCI, Motor Coach Industries, Ltd.,
Transportation Manufacturing Corporation
and Greyhound Lines, Inc.)
(D-168, D-169, D-184)

Comments: 3.1, 3.3, 3.4, 3.6, 6.7, 6.9, 7.5, 8.1, 8.5, 8.7, 8.8, 9.1, 10.4, 10.5, 13.2, 13.4, 13.5

2.1.13 Sheller-Globe Corporation (Superior Coach Division)
(D-175)

Comments: 3.2, 3.3, 3.5, 3.6, 3.7, 4.1, 4.2, 4.4, 5.1, 5.2, 5.4, 5.5, 5.6, 6.2, 6.3, 6.4, 8.1, 8.2, 8.5, 8.6, 8.7, 8.8, 8.10, 9.1, 9.7, 9.10, 9.11, 10.4, 13.1, 13.3, 13.6

2.2 MANUFACTURERS RELATED TO THE BUS INDUSTRY

2.2.1 Horton Industries, Inc.
(D-199L)

Comments: 6.7, 9.3

2.2.2 Jacobs Manufacturing
(D-146)

Comments: 9.4

2.2.3 Renault USA
(D-177)

Comments: 7.5, 8.7, 9.3, 9.6, 9.11

2.2.4 Schwitzer Engineered Components
(Wallace Murray Corporation)
(D-176)

Comments: 6.1, 9.3

2.2.5 Walker Manufacturing
(D-148)

Comments: 8.1, 8.4, 8.7, 9.8, 9.10, 10.1, 10.4

2.3 ASSOCIATIONS

2.3.1 American Bus Association
(D-178)

Comments: 4.1, 6.7, 6.9, 7.5, 9.1, 10.4, 10.5, 13.3

2.3.2 American Public Transit Association
(PHW-267, PHSF-67, D-142, D-179, D-60)

Comments: 3.1, 3.3, 3.6, 3.7, 6.1, 6.5, 6.6, 7.2, 9.1, 9.2, 10.4, 11.1, 11.2, 13.2, 13.5

2.3.3 Motor Vehicle Manufacturers' Association
(PHW-19, D-188, D-100)

Comments: 3.1, 3.2, 3.3, 3.6, 3.7, 4.1, 4.2, 6.5, 6.6, 7.3, 7.4, 7.6, 7.7, 8.3, 8.8, 9.2, 9.3, 9.4, 9.5, 9.9, 10.1, 11.1, 13.3, 13.7

2.3.4 National Association of State Directors of Pupil Transportation Services
(D-183)

Comments: 5.1

2.3.5 National School Transportation Association
(PHW-180)

Comments: 5.1, 5.2, 5.3

2.4 BUS USERS

2.4.1 Osakis Public Schools
Osakis, MN
(D-158)

Comments: 6.1, 13.5

2.4.2 Southern California Rapid Transit District
(PHSF-325)

Comments: 10.2, 13.3, 13.4, 13.5, 13.9

2.4.3 Trailways
(D-191)

Comments: 6.1, 6.9, 6.11, 9.3, 9.4, 13.2, 13.4

2.4.4 TRIMET
(D-085, PHSF-211, D-162)

Comments: 3.1, 6.6, 7.1, 7.3, 9.1, 9.3, 9.5, 9.6, 12.1, 13.5, 13.6

2.4.5 Vigo County School Corporation
Terre Haute, IN
(D-088)

Comments: 3.4, 3.5, 4.1, 13.5

2.4.6 Weatherford Public Schools
Weatherford, OK
(D-205L)

Comments: 5.1, 5.2, 13.7

2.5 PRIVATE CITIZENS AND CITIZENS GROUPS

2.5.1 David W. Davis
(D-108)

Comments: 13.5

2.5.2 James V. Dickey
(D-127)

Comments: 13.5

2.5.3 T. Frederick Feldman
(D-043)

Comments: 13.5

2.5.4 Glen Park Association Traffic Committee
(PHSF-56)

Comments: 3.4, 4.1, 5.1, 13.4, 13.5

2.5.5 J. Bryan Grubbs
(D-117)

Comments: 13.4, 13.5

2.5.6 Ken Howse
(D-054)

Comments: 3.3, 13.5

2.5.7 Charles L. Hutton, Ph.D.
(D-143)

Comments: 13.5

2.5.8 Herb Jasper
(PHSF-322)

Comments: 4.1

2.5.9 Irving Kaplan
(D-134)

Comments: 13.4

2.5.10 Midwest Noise Council
(D-161)

Comments: 4.4, 5.5, 8.10, 13.3

2.5.11 Paul I. Mohler
(D-097)

Comments: 3.1, 3.3, 4.1, 6.1, 6.9, 13.5

2.5.12 Richard Peppin
(PHW-8)

Comments: 3.3, 4.1, 6.11, 13.4, 13.5

2.5.13 Stuart Rogers
(D-052)

Comments: 13.4

2.5.14 Theressa Seitiff
(D-138)

Comments: 5.1, 5.4

2.5.15 Vicki Shidel
(D-063)

Comments: 13.5

2.5.16 Joseph A. Shirley
(D-034, D-125)

Comments: 13.5

2.5.17 James M. Stoner
(D-086)

Comments: 13.5

2.5.18 Dorothy S. Tavern
(D-032)

Comments: 13.4

2.5.19 Gordon J. Tucker
(PHSF-425)

Comments: 13.5

2.5.20 Steve Tyson
(PHSF-147)

Comments: 4.1, 6.11, 7.2

2.5.21 Brett Yancy
(D-147)

Comments: 3.5

2.5.22 R. Yankovec
(PHSF-423)

Comments: 13.4

2.6 BIOMEDICAL COMMUNITY

2.6.1 Calais Regional Speech Center
(D-119)

Comments: 13.5

2.6.2 Duke University Medical Center
Center for Hearing and Speech Disorders
(D-118)

Comments: 13.5

2.6.3 Eugene Hearing and Speech Center
(D-133)

Comments: 13.5

2.6.4 John L. Fletcher, Ph.D.
Professor and Director of Research
Department of Otolaryngology and
Maxillofacial Surgery
University of Tennessee
College of Medicine
(PHSF-38)

Comments: 3.3, 3.4, 6.1, 13.5

2.6.5 Helen Hayes Hospital
(D-140)

Comments: 13.5

2.6.6 Indiana School for the Deaf
Audiology Clinic
(D-114)

Comments: 3.5

2.6.7 New Jersey Training School at Totowa
Department of Speech Pathology
(D-110)

Comments: 13.5

2.6.8 Patricia Ross, School Nurse and Registered Audiometrist; Education Specialist, San Francisco Unified School District; President, California School Health Association; Executive Board of Directors, California School Nurses' Organization
(PHSF-418)

Comments: 3.5

2.6.9 Sinai Hospital of Baltimore
(D-087)

Comments: 13.5

2.6.10 Sunnyvale Medical Clinic
(D-130)

Comments: 3.3, 13.5

2.7 STATE AND LOCAL GOVERNMENTS

2.7.1 Officers Richard Bodisco and Ed Buck
Noise Abatement Unit
San Francisco Police Departement
(PHSF-130)

Comments: 5.1, 13.4

2.7.2 Lt. Edmund R. Calcagni
Police Department
Providence, RI
(D-120)

Comments: 13.5

2.7.3 Edward J. DiPolvere, Supervisor
Noise Control Officer
Department of Environmental Protection
State of New Jersey
(PHW-213)

Comments: 3.6, 3.9, 7.2, 13.5

2.7.4 Honorable Diane Feinstein
Board of Supervisors
City of San Francisco
(PHSF-9)

Comments: 4.1, 5.1, 6.1, 6.10, 10.2, 13.4, 13.5, 13.7

2.7.5 Dr. Robert Gay
Oregon Department of Environmental Quality
(PHSF-290)

Comments: 12.1, 13.2, 13.3, 13.5

2.7.6 Department of Environmental Protection
Grand Rapids, MI
(D-053)

Comments: 13.5

2.7.7 Robert D. Hellweg, Jr.
Manager, Noise Operations Section
Division of Land Use/Pollution Control
State of Illinois EPA
(PHW-69)

Comments: 3.6, 3.9, 5.1, 10.2, 13.4

2.7.8 Dr. Paul Herman
Noise Control Officer
City of Portland, OR
(PHSF-177)

Comments: 6.1, 6.5, 6.10, 6.11, 7.1, 12.1, 13.2, 13.3, 13.5, 13.6

2.7.9 Jerome Lucas
Office of Noise Control
California State Department of Health
(PHSF-159)

Comments: 4.1, 9.4, 13.3, 13.5

2.7.10 Mayor of Portland, OR
(PHSF-174)

Comments: 6.1, 12.1

2.7.11 Honorable John Molinari
Board of Supervisors
City of San Fransciso
(PHSF-30)

Comments: 4.1, 5.1, 6.11, 8.6, 8.9, 13.2, 13.4, 13.5

2.7.12 John W. Ross, Jr., Mechanical Engineer
Noise Control
City of San Francisco
(PHSF-414)

Comments: 4.1, 5.1, 9.4

2.7.13 Speech and Hearing Services
Board of Cooperative Educational Services
Third Supervisory District
Suffolk County, NY
(D-132)

Comments: 13.5

2.7.14 Upper San Juan Regional Planning Commission
(D-145)

Comments: 4.1, 6.7, 6.9, 13.5, 13.6

2.8 FEDERAL GOVERNMENT

2.8.1 Honorable Les Au Coin
Member of Congress
Portland, OR
(D-192L)

Comments: 13.2

2.8.2 U.S. Department of Transportation
(D-166)

Comments: 3.2, 6.11, 9.2, 9.3, 9.6, 9.7, 9.8, 10.1, 10.6, 10.7, 13.2, 13.3

2.8.3 Honorable Mark O. Hatfield
U.S. Senator
Oregon
(D-203L)

Comments: 13.9

SECTION 3

HEALTH AND WELFARE BENEFITS: COMMENTS AND RESPONSES

3.1 Justification for Benefits Due to the Regulation

Issue: Do the health and welfare benefits, which are expected to result from lower bus noise levels, justify the regulation?

Comments:

Two bus manufacturers (2.1.12, 2.1.8), two associations (2.3.3, 2.3.2), one bus user (2.4.4) and a private citizen (2.5.11) stated that the health and welfare benefits, which are expected to result from lower bus noise levels, were not sufficient to justify the regulation. One bus manufacturer (2.1.8) stated that the 77 dB exterior level would not be required to protect public health and welfare. One association (2.3.2) remarked that very little additional health and welfare benefits would be gained from reductions below an 80 dB level. The bus user (2.4.4) stated that with current fleet replacement schedules and EPA's proposed standards, it would take 20 years to have a "pure EPA fleet," and almost as long before any appreciable impact was noticed.

Response:

The Regulatory Analysis for the Final Bus Noise Emission Regulation outlines in detail EPA's estimates of the health and welfare benefits to be gained from the noise regulation, and illustrates the basis upon which the Agency made the decision to regulate buses. The data contained in the Regulatory Analysis represents EPA's best estimate of the nationwide traffic noise situation. The impact/benefit estimates presented depend upon statistical representations of traffic noise typical throughout the country. The analysis demonstrate that significant benefits will accrue to the public as a result of a 77 dB exterior level. The bus users assessment that maximum benefits from this regulation will not be realized until the total bus fleet is replaced by quieted units is correct. We estimate this should occur within 14 to 19 years. However, communities will realize increasing benefits on a continuing basis as old noisy buses are replaced by quiet units.

3.2 Health/Welfare Criteria

Issue: Are the criteria used for regulating buses as a major source of noise valid?

Comments:

Seven commenters (2.8.2, 2.1.10, 2.1.7, 2.1.8, 2.3.3, 2.1.2, 2.1.13) stated that the criteria used to determine the expected adverse health and welfare impacts and benefits of the regulation are different from those that were used to identify buses as a major source of noise. Three bus manufacturers (2.1.10, 2.1.7, 2.1.2) and an association (2.3.3) remarked that since EPA used new criteria in setting the regulation, the Agency should provide supporting data for those criteria and should update the Criteria and Levels Documents according to Section 5 of the Noise Control Act. Two bus manufacturers (2.1.8, 2.1.2) stated that EPA used a new methodology to assess health and welfare benefits in order to "suit the predetermined aim of regulating bus noise after the previously established EPA methodology failed to support the Agency's May 1975 identification of buses as a major source of noise." Three bus manufacturers (2.1.10, 2.1.8, 2.1.13) and an association (2.3.3) stated that the new criteria were unproven and did not justify the regulation of bus noise. One bus manufacturer (2.1.13) remarked that no matter what criteria were used, school buses should not be regulated as a major source of noise.

Response:

The estimated benefits to be accrued from the regulation of bus noise are not based entirely on one or two criteria, but upon several criteria. These criteria have been identified and documented in the Regulatory Analysis. EPA has not abandoned the previously established methodology for assessing people's general adverse response to noise. That methodology is, in fact, used in the analysis estimating benefits of the bus regulation. The Agency believes, however, that in some instances it is necessary to describe more completely the impact of noise on people. EPA further believes that noise-induced interference with human activities is an important factor in determining the potential benefits of noise control, correlating quite well with the general aversiveness people feel toward noise. In these cases, other supplementary methods are used, such as estimates of speech interference and sleep disturbance. These activity interferences, in turn, are used as indicators of people's general adverse response to noise. All criteria used in the analyses were made available to the public at the time the bus regulation was proposed. Commenters have therefore had the opportunity to review this material and offer their technical assessments of its validity and applicability. A detailed discussion of the reasons for undertaking the supplementary analyses is presented in the Regulatory Analysis.

EPA recognizes that there are still some unknowns about the effects of noise on human beings. However, the Agency has developed criteria for describing the effects of noise which best reflect the consensus to date of current thought and investigation of the subject. For this reason, the health and welfare criteria used is applicable to the regulation of bus noise.

Data provided in the Regulatory Analysis illustrate the basis upon which EPA made the decision to regulate buses. The criteria and methodology used to estimate health and welfare benefits of bus noise regulation are fully discussed. It should be pointed out that buses, identified as a class, are major sources of noise. It is upon this identification that school buses, as well as transit and intercity buses, are regulated.

3.3 Speech Interference

Issue: Is the impact of speech interference due to bus noise significant?

Comments:

Four bus manufacturers (2.1.7, 2.1.10, 2.1.12, 2.1.8) and two associations (2.3.3, 2.3.2) stated that EPA had not made a clear case for speech interference for passengers and the exposed community. One bus manufacturer (2.1.7) questioned EPA's assumption that 80 million workers walk one-half mile per day along bus routes. Another bus manufacturer (2.1.10) stated that EPA's health/welfare analysis assumed that all people in the vicinity of a bus, or on a bus, had speech interference, while it ignored those who were alone, i.e., not talking to anyone, and those who were impacted by other sources. The manufacturer also stated that EPA's analysis considered that everyone exposed to bus noise was exposed to the maximum level. A third bus manufacturer (2.1.8) stated that buses built to an 80 dB regulatory level would cause no more than momentary speech interference for people inside buses, and no speech interference for those inside houses. The manufacturer also stated that it was incorrect to assume that because a bus produced a given level of noise, speech interference would occur 100 percent of the time for people in the designated area, i.e., indoors, outdoors. Two bus manufacturers (2.1.7, 2.1.10) stated that passenger speech interference due to bus noise was very weak because the noise from passengers masked the bus. This manufacturer also questioned the validity of the speech interference criteria on the basis that it was derived under test laboratory conditions. Another bus manufacturer (2.1.13) stated that speech interference from bus pass-by noise was more applicable to transit buses than school buses or intercity buses. A private citizen (2.5.11) stated that it did not matter if bus noise interfered with normal conversation since it was a short-time interference only and that people who complained about bus noise probably did not ride buses.

Two members of the biomedical community (2.6.10, 2.6.4) stated that the levels of noise that produce speech interference should be avoided because exposure to high levels of noise over long periods of time could produce physiological and psychological stress. These commenters further stated that speech interference problems were of considerable significance in our society, particularly in transportation areas, and that they were well documented and valid in a health and welfare analysis. One private citizen (2.5.12) stated that he had to keep his automobile windows closed when buses passed in order to hear conversation or listen to the radio. Another private citizen (2.5.6) stated that noise from passing buses and trucks in Detroit was such that it was impossible to use a pay telephone on a busy street because of the inability to hear the party on the other end of the line.

Response:

The Regulatory Analysis for the final bus noise regulation clearly identifies the basis on which interior noise interferes with the speech of bus passengers, and exterior noise interferes with the speech of residents and pedestrians. The degree of speech communication interference by bus type is also presented in the Regulatory Analysis.

EPA's studies are in agreement with the comment that speech disturbance from passby noise is much higher in the case of transit buses. Data supporting this are outlined in the Regulatory Analysis. Nevertheless, there is impact attributable to intercity buses and school buses as well.

The estimate that 80 million workers walk one-half mile per day along a bus route is based on data from a study performed by the Department of Transportation. No data has been produced to contradict DOT's findings in this area. The health and welfare analysis, as summarized in the Regulatory Analysis, more clearly accounts for what appeared to be inconsistencies and data gaps in the original analysis regarding speech communication impact.

It should be noted that speech interference has been used in the analysis as a proxy for general activity interference and annoyance effects of noise. Activity interference has been shown to correlate quite highly with respondent's verbalized annoyance. The intrusive nature of vehicle passby noise is such that any one of a number of activities a person may be engaging in may be disrupted. An illustration of this may be made using the example cited by the commenter who stated that if a person is alone when impacted by noise, this person's speech is not interrupted. However, this person may be adversely impacted by being startled by the noise, or by having his or her train of thought interrupted. In a general sense, it is the potential for communication interference that is important. Nevertheless, the relative benefits cited in the analysis are directly applicable to these situations where intruding noise does in fact interfere with verbal communication.

In regard to the appropriateness of the speech interference criteria, EPA has worked closely with scientists regarding methods to quantify this relationship. It is known that buses do create situations where speech is interfered with. The acoustical criteria used represent the best consensus to date for describing how noise interferes with communications. Documentation and clarifying data are outlined in the Regulatory Analysis.

In reference to the comment about passenger noise masking bus noise, thereby reducing the impact of the bus noise, this does not accurately reflect the true situation. The bus noise does not disappear, but is instead added to the noise of the bus passengers. What complicates this problem is that passengers attempting to converse must talk in louder voices to be heard. Interior bus noise may even be a factor causing passengers to converse at higher conversational levels. Although talkers will increase vocal effort in the presence of high intensity background noise, this situation is clearly undesirable over an extended period of time. Furthermore, in regard to school buses, EPA acknowledges that, in some cases, child generated noise may be the dominating interior noise source on the bus. However, child generated noise may, in part, be attributable to the high engine-related interior noise levels. It is well documented that high noise creates a need for greater vocal effort by people wishing to be heard over the vehicle's noise.

In the health and welfare analysis EPA does not assume that everyone is exposed to the maximum noise level. Rather, levels below the maximum are considered in the analysis, and impact is computed from an average level or L_{eq}.

Data presented in the Regulatory Analysis illustrate the degree of speech interference potentially incurred by bus passengers and by residents inside houses with an 80 dB bus. Further, information is presented that shows the basis on which the average maximum bus passby levels were obtained.

3.4 Sleep Disruption

Issue: Is the impact of sleep disruption due to bus noise significant?

Comments:

Five bus manufacturers (2.1.10, 2.1.8, 2.1.7, 2.1.12, 2.1.2) questioned the impact of bus noise on sleep. One manufacturer (2.1.10) stated that, in terms of sleep awakening, by the year 2000 only 5 1/2 percent of the population could possibly benefit from the regulation, and less than 14 percent of the population would benefit from the total elimination of buses. Another manufacturer (2.1.8) stated that the basis for the calculations of sleep disruption and sleep awakening were not adequately defined and that the Sound Exposure Level (SEL) data used in the EPA analysis did not seem to be the same SEL as commonly defined. The manufacturer also questioned EPA's basis for estimating the number of windows open/closed on homes, and asked how EPA accounted for factors of ambient level, familiarity or expectation. Three bus manufacturers (2.1.10, 2.1.7, 2.1.2) questioned the application of laboratory studies using primarily aircraft noise stimuli to the prediction of sleep disturbance from bus noise, and further questioned the validity and accuracy of the criteria. One bus user (2.4.5) stated that he found it difficult to believe that the lack of noise deterrent materials in buses contributed toward sleep disturbance on the part of those with whom the bus came in contact.

One citizens' group (2.5.4) commented that they had been awakened from sleep and presumed it was due to traffic noise, and that buses could cause sleep disruption during the day for day sleepers. A member of the biomedical community (2.6.4) commented that sleep awakening and sleep disruption are well documented and are valid metrics in a health and welfare analysis.

Response:

The EPA recognizes that there are still some unknowns about the effects of sleep disturbance from noise. The long-term health related consequences of noise disturbed sleep are not well documented at this time. The Agency, working closely with scientists who have studied those areas, has developed criteria for describing the effects of noise on human beings which best reflect the scientific consensus to date. It is EPA's belief that this acoustical sleep criteria is applicable to the regulation of bus noise.

It is clear from everyday experience that loud noise does disturb sleep. This disturbance may lead to annoyance, but can in itself represent a degradation of health. For instance, noise may make falling asleep more difficult. A noise intrusion during sleep in many cases induces a shift in sleep stage. If the noise is of sufficient duration or intensity, an awakening may result. Since sleep itself is a biological necessity, and is thought to be a restorative process during which the organs of the body renew their supply of energy and nutritive elements, repeated disturbances of people's sleep can be expected to adversely affect their health and well-being. In this regard, noise that disrupts sleep is considered a health hazard.

Whether noise will disturb or arouse a sleeping person depends upon a number of factors. The greater the intensity of a noise source, the more likely a sleeping person will be disturbed or awakened. Increases in stimulus duration are thought to increase the probability of a response. The more an unsteady noise fluctuates, the greater the likelihood of a disturbance. Sleep disruption has been attributed to noises of rather rapid onset. Past experiences, meaningfulness, and strong emotional or motivational connotations of a noise may produce an arousal from sleep. There is some limited evidence that familiarity with the noise may decrease the incidence of response. Older individuals are generally more easily affected than children or younger adults. There are some indications that women are more readily disturbed than men. A person's general physical and mental health can also be a determinant of increased susceptibility to sleep disruption. In short, the effects of noise on sleep are quite pervasive, but depend on a great number of factors.

Results of surveys conducted in communities affected by noise show that disruption of sleep is an underlying cause of people's negative reactions and complaints about noise. In these surveys, respondents were asked if noise prevents them from falling asleep or wakes them up. Some questions dealt with the quality or length of sleep in noisy environments, methods typically used to cope with sleep disturbing noise (e.g., sleeping pills, keeping windows closed, etc.), as well as judgments pertaining to feelings of good health and well-being following nights of noise-induced sleep disruption. For instance, of persons who said that they had been bothered by noise in their neighborhoods, 60 percent cited sleep disturbance as one of the most common and annoying aspects of the urban noise problem, according to a recent attitudinal survey in the United States. It should be noted that individual differences in sensitivity to noise are quite large. There are people whose sleep may not be affected by noise. Conversely, there are people who find low levels of noise intolerable and sleep under such environmental conditions impossible.

In summary, it is EPA's view that laboratory data can be used to reasonably approximate impact in field situations. The effects of noise on sleep are real as indicated by common, everyday experience. It is thus reasonable to extrapolate from the laboratory. It should be noted that the laboratory stimuli in these studies consisted of aircraft, traffic, and synthetic sounds.

The sound exposure level used by EPA is the same as that which is in standard usage. The computed sound exposure level accounts for distance variations for passby levels.

Reasonable assumptions had to be made in arriving at some calculations. In determining the number of open/closed windows on homes, assumptions were made based on the time of day, the season, and geographical location. Those assumptions are discussed in the Regulatory Analysis.

The results of the health and welfare analysis dispute the claim that only 5 1/2 percent of the population could benefit from the bus regulation. EPA estimates that approximately 30 million riders and 400,000 bus drivers are exposed daily to levels of interior bus noise that interfere with speech communications and that may contribute to their risk of hearing impairment, depending on their other noise exposure. Further, traffic noise adversely impacts approximately 93 million people. Buses are a significant component of the traffic noise problem.

3.5. Hearing Damage Risk

Issue: Is the contribution of bus noise to hearing damage significant?

Comments:

One bus manufaturer (2.1.7) asked if, in EPA's opinion, interior noise within current or future buses (i.e., TRANSBUS) specified by DOT does or will cause hearing damage to bus operators and passengers. If so, the manufacturers asked what the interior noise levels and exposures were which EPA believed would cause hearing damage to operators and passengers. They also asked EPA to describe the tests conducted, the data derived from such tests and the reasoning which led EPA to conclude that such hearing damage would or might occur. A second manufacturer (2.1.8) pointed out that, in reference to data in the Background Document, they believed that the numbers presented should indicate the number of decibels of hearing loss accumulated over the number of bus operators per 40 years of driving. Also, they did not understand the basis of a higher percentage improvement in hearing loss reduction with exposure to higher noise levels when people were not in buses. A third bus manufacturer (2.1.13) questioned whether the potential for hearing loss by drivers and passengers was of sufficient magnitude to form a justification for the regulations which were proposed to apply to school buses. The manufacturer pointed out that the daily exposure time was questionable as it was assumed to be equal for passengers and the driver - which was not usually the case. The manufacturer felt that the determination of the FIH factor assumed a 40 year exposure which was unrealistic for both drivers and pupils. A fourth bus manufacturer (2.1.10) stated that the probability of hearing damage on school buses was nil because of the small amount of exposure. One bus user (2.4.5) commented that he found it difficult to believe that the lack of noise deterrent materials in buses contributed toward deafness or hearing loss for bus riders.

A member of the biomedical community (2.6.8) commented that she had seen a significant increase in high tonal losses among high school students and that, among other noise exposures, these students had been school bus riders from kindergarten on up to that time. The commenter also stated that teachers had noticed that students did not seem to be able to hear what they were saying for the first five minutes to one-half hour of classroom instruction after riding buses for prolonged periods. The commenter expressed concern about noisy school buses and the effects on hearing handicapped students who rode them. A second member of the biomedical community (2.6.6) commented that bus noise was amplified to dangerously high levels through a hearing aid and that the effects of bus noise on hearing impared people must be considered. A private citizen (2.5.2) commented that he rode buses everyday and that because buses were too noisy he was required to turn down his hearing aids when riding.

Response:

Hearing loss is related not only to the intensity of noise exposure, but also to the duration of the exposure. That is, exposure to noise of very high intensity over a short period of time can be equivalent to exposure to a lower level of noise over a longer period of time, in terms of hearing loss. Furthermore, the occurrence of noise induced hearing impairment is cumulative in nature, i.e., it may be due to exposure to many sources over a long period of time. To be accurate and representative, the analysis considers bus as well as non-bus noise exposure. In computing hearing loss due to bus noise, criteria presented in the EPA Levels Document were used.

Those criteria represent the average amount of hearing loss statistically expected averaged over the frequencies of 500, 1000, 2000 and 4000 Hz and further averaged over a period of 40 years. This corresponds to a median exposure of approximately twenty years. Because the analysis takes both bus and non-bus noise into account, the criteria used are reasonable. In arriving at daily exposure time for bus passengers and drivers, the best available data was incorporated into the Regulatory Analysis. The analytical results related to hearing loss are presented in the Regulatory Analysis.

3.6 Computation of Impacts/Benefits

Issue: Is the computational methodology for estimating bus noise impacts/ benefits valid?

Comments:

A state government official (2.7.3) commented that a short, single acceleration near a bus stop can cause intrusive noises which might not show up in L_{dn} or L_{eq} measurements. An association (2.3.2) questioned how EPA calculated the expected health benefits of the regulation and also how the expected welfare benefits were calculated. A bus manufacturer (2.1.10) questioned how EPA determined a point, in terms of noise level and number of occurrences, at which disturbances became detrimental in terms of health and welfare. A second association (2.3.3) stated that the difference in population exposure under the proposed regulation versus the unregulated state was insignificant, and that the community would detect no change in traffic noise level as a result of the regulation. The association also stated that the Background Document did not account for the fact that sound generated by buses dissipated rapidly in a direction perpendicular to the bus route, and thus high-rise occupants are actually shielded from noise. This commenter also questioned the assumptions and data used to project the impact of bus noise. A second state government official (2.7.7) commented that the overall benefits to be obtained from the proposed bus regulations had been underestimated because the analysis did not consider the fact that transit buses in medium-sized cities operated in residential areas where trucks do not contribute to the urban noise levels. A bus manufacturer (2.1.8) stated that intercity, transit and school buses should each have separate and distinct health/welfare impact analyses and should not be treated together. The manufacturer questioned the arbitrarily chosen level of 55 L_{dn} with its margin of safety, the linear relationship between 55 and 75 dB, and asked why new data developed by the Committee on Hearing and Bioacoustics (CHABA) with a threshold of 60 dB was not used. The manufacturer questioned the use of percent reduction in impact as a measure of benefit and asked if EPA had polled citizens living in areas where buses operated to determine if, in fact, they were disturbed by noise from transit, intercity and school buses. The manufacturer also questioned the logic of low-rise point source attenuation versus high-rise line source attenuation. A third bus manufacturer (2.1.12) stated that the proposed standards failed to recognize that predominant use of intercity coaches was over highways in rural areas. A fourth bus manufacturer (2.1.2) commented that maximum bus noise occurred at the transmission shift points for a duration of no more than one second (in the majority of instances it was less than 0.5 seconds) and this maximum noise level and shift point did not occur when the vehicle was operating under less than wide-open throttle conditions, which was contrary to EPA's description of events. A fifth bus manufacturer (2.1.13) stated that the fractional impact procedure used as the basis for identifying noise sources was questionable and the validity suspect;

it would identify as a major noise source one which is large in either extensity or intensity.

Response:

Buses often do make short, single accelerations near bus stops which have been accounted for in the analysis pertaining to activity interference.

EPA's definition of health, which is contained in the Regulatory Analysis, includes elements other than simply physical harm. This definition is commonly accepted among the scientific community including the World Health Organization. Health and welfare are not separate entities but are considered as a whole. Thus, EPA has not separately calculated welfare benefits and health benefits, but rather addressed health and welfare benefits as a whole.

The Regulatory Analysis for the Final Bus Noise Emission Regulation fully outlines the methodology used for calculating the estimated health and welfare benefits of the bus noise regulation and the results of these calculations.

EPA has not determined a point below which interferences with human activity is not detrimental to public health and welfare. In the context of the analysis, activity interference is used as an indicator of the objectionableness of the noise from individual vehicular passbys. In fact, activity interference correlates quite highly with annoyance from noise. Thus, the point below which activity interference is not detrimental is believed to be irrelevant. If noise is loud enough to interfere with human activity, we would anticipate a number of people to be annoyed with that noise.

In regard to the comment that overall traffic noise reductions will not be detected by the community, it should be noted that the reduction in bus noise will be quite perceptible. This is clearly demonstrated in the analysis of activity interference. Reductions in overall traffic noise are anticipated over the long term.

EPA's health and welfare model for surface transportation vehicles represents EPA's current best estimates of the nationwide traffic noise situation and associated impact upon public health and welfare. Although the model is based on the most current data relating to streets and highways, number of surface transportation products in use, and the mode and nature of operation of the vehicles, the model must depend on statistical representatives of reality, and therefore may not accurately represent individual situations that vary significantly from the norm.

In certain respects, the health and welfare model may overestimate impacts; however, in other situations, impacts may be underestimated. When it was necessary to choose between an assumption that could potentially overestimate the situation and another assumption that most likely would underestimate the impact, the latter assumption was chosen. In general, these situations tend to balance each other, and if any of the premises used are in error, they should tend to underestimate the total impact of bus noise on the nation's population.

In the Regulatory Analysis the separate health and welfare impacts for intercity, transit and school buses are presented along with the aggregate health and welfare impact of buses.

The identified value of L_{dn} = 55 dB (corresponding to L_{dn} = 45 dB for indoor situations) was determined by EPA to be the level of noise that, if achieved, would result in the absence of adverse noise impact on the public.

The rationale for identifying levels protective of public health and welfare is documented in the EPA Levels Document. It should be noted that the identified levels were not used as a basis for limiting noise emission from buses (i.e., the bus noise regulation as promulgated does not in itself achieve a noise environment below the identified protection limit). What was used as a basis for the regulation on bus noise were the latest, documented, scientific criteria that relate noise to human response.

Data developed by CHABA as cited by the commenter was not used because it essentially refers to land use planning and is not applicable to a bus emission regulation.

The percent reduction metric was used to compare various regulatory alternatives. This is a method that permits relative comparisons to be made between different noise reduction alternatives. It is not used, nor intended to be, an absolute indicator of impacts or benefits. However, estimates of more absolute benefits are presented in the analysis.

The public comment period following the proposed bus regulation is somewhat similar to polling the general public for opinions concerning the regulation. Response has shown that many people are concerned about all types of bus noise. We have used the latest scientific information applicable to noise in general. A survey conducted by the Motor Vehicle Manufacturers' Association (MVMA) showed that for those persons acknowledging exposure to bus noise, it ranked high in terms of intensity and severity of impact. They indicated that they considered bus noise to be one of the most objectionable traffic noise sources.

With respect to the comment pertaining to the fractional impact procedure, it is quite possible that a large proportion of a noise impact may be found in sub-neighborhoods exposed to noise levels of only moderate value. Although people living in proximity to a noise source are generally more severely impacted than those people living further away, this does not imply that the latter should be totally excluded from an assessment where the purpose is to objectively and quantitatively evaluate the magnitude of noise impact. People exposed to lower levels of noise may still experience an adverse impact, even though the impact may be small in magnitude. The fractional impact method considers the total impact upon all people exposed to noise recognizing that some people incur significantly greater noise exposure than others. The procedures duly ascribe more importance to the more severely affected population.

Any procedure which evaluates the impact of noise upon people or the environment, as well as the health and behavioral consequences of noise exposure and resultant community reactions, must encompass two basic elements of the impact assessment. The impact of noise may be intensive (i.e., it may severely affect a few people) or extensive (i.e., it may affect a larger population less severely). EPA does not believe that a major noise source must be large in both extensity and intensity. Implicit in the fractionalization concept is that the magnitude of human response varies proportionally with the degree of noise exposure, i.e., the greater the exposure, the more significant the response. Another major assumption is that a moderate noise exposure for a large population has approximately the same noise impact upon the entire community as would a greater noise exposure upon a smaller number of people.

The fact that some use of intercity coaches is over highways in rural areas has been accounted for in the final Regulatory Analysis. Low-rise point source attenuation has also been addressed in the Regulatory Analysis.

The problem as cited by a commenter that noise dissipates rapidly in a perpendicular direction has been addressed in the Regulatory Analysis.

3.7 Day/Night Operation of Buses

Issue: Is the assumption pertaining to nighttime use of buses correct?

Comments:

Three bus manufacturers (2.1.13, 2.1.2, 2.1.8) and two associations (2.3.2, 2.3.3) stated that EPA's estimate of the number of transit buses operating at night, causing sleep disturbances, was too high. The comments also stated that buses operating at night make fewer stops than those running during the day, and because of less traffic can often go for many blocks without having to stop at a light, and cause, therefore, less noise from acceleration and deceleration.

Response:

The model originally used the estimate that 16 percent of the total bus population operated at night. A survey of 41 bus companies was conducted to verify this estimate. It was found that during the nighttime hours of 10 pm to 6 am, 75 percent of the surveyed companies maintained operations during some portion of this time. Only between midnight and 4 am were there significant reductions in the number of companies providing bus service, since only 10 percent of the companies were providing service during this time period. On the average, 35 percent of the bus companies were providing night operations. Considering that these companies were not operating all of their buses, an estimate of 16 percent of nighttime operations was considered appropriate.

SECTION 4

INTERIOR NOISE: COMMENTS AND RESPONSES

4.1. Health & Welfare

Issue: Are there benefits in regulating interior bus noise?

Comments:

Eight commenters (2.5.20, 2.5.12, 2.7.4, 2.7.12, 2.3.1, 2.7.9, 2.5.8, 2.7.11) indicated support for the regulation of interior bus noise levels citing various reasons for their assent. One commenter (2.7.4) remarked that the reduction of the interior noise level was critical to encouraging transit use, while another (2.5.12) claimed that interior noise was uncomfortable and probably unhealthy. A third commenter (2.7.12) suggested that bus interiors be quieted further, including less tire and ventilation noise. Another individual (2.5.8) voiced concern about bus noise, both interior and exterior, and had seen no significant improvement in levels in the last several years.

Another eight commenters (2.5.4, 2.1.13, 2.7.14, 2.1.7, 2.3.3, 2.1.10, 2.5.11, 2.4.5) questioned the benefits of regulating interior noise levels. Four commenters (2.1.13, 2.4.5, 2.5.11, 2.3.3) believed that school bus noise was due primarily to passengers and therefore not related to the vehicle. One bus manufacturer (2.1.7) questioned whether or not there was sufficient data in the Background Document to justify the lowering of interior noise levels while another (2.1.10) commented that there was no justification for lowering interior levels below 90 dB. Another commenter (2.5.4) stated that exterior noise, not interior, was the problem.

Response:

EPA estimates that approximately 30 million riders and 400,000 bus drivers are exposed to noise inside buses. Estimates of two kinds of impacts associated with interior bus noise were made: risk of potential hearing damage, and interference with speech communications for bus drivers and passengers. Although, speech interference is related, in part, to the general comfort of the ride, the implications of speech interference or masking of warning signals to the driver during emergency situations could have critical implications. The Regulatory Analysis presents in detail EPA's estimates of interior health and welfare benefits of this regulation.

Compliance with the standards for interior noise levels is expected to result in 28 percent, 85 percent, and 78 percent reductions in potential passenger speech interference impact for intercity, transit and school buses respectively. Compliance with the interior noise emission standards for all bus types is expected to result in a one (1) to 100 percent reduction in potential risk of hearing loss for bus drivers and passengers depending upon the range of their daily non-bus noise exposure. For example, if the passenger's or driver's daily non-bus noise exposure is 60 dB, the percent reduction, due to the regulation, of potential hearing damage risk would be about 100 percent. However, with a daily non-bus noise exposure level of 80 dB, the percent reduction in potential damage risk would decrease to about one (1) percent.

4.2 Legality

Issue: Does EPA have the authority to regulate interior noise and is there a possible conflict between existing State and local school district bus interior specifications and the bus regulation?

Comments:

One trade association (2.3.3) questioned EPA's statutory authority to specify interior sound levels. One school bus manufacturer (2.1.13) stated that since some State and local school districts have laws and regulations about interior surfaces for vandalism, the use of sound absorptive surfaces that may be required in order to meet interior levels might require a variance or change in existing laws.

Response:

EPA believes that the authority to set both interior and exterior noise levels is provided by Section 6 of the Noise Control Act, 42 U.S.C. §4905. The Act requires the Administrator to establish standards which are requisite to protect the public health and welfare, taking into account other considerations, set forth in the statute. The protection to be provided by the standards is not limited to those segments of the public who are exposed only to exterior bus noise. The Agency has determined that the interior bus noise standard is requisite to protect the health and welfare of those members of the public who encounter interior bus noise.

Based on the Agency's technical assessment of potential interior noise control measures, we believe that the Federal interior noise emission standard will be totally compatible with existing State and local laws against vandalism of interior bus surfaces. Furthermore, the Agency believes that the reduction of interior school bus noise levels can be brought about as a result of appropriate exterior noise abatement treatments, thereby avoiding any need to alter the anti-vandalism interior surfaces presently installed in some school buses.

4.3 Economic Impact

Issue: What will be the cost impact on industry of interior noise test procedures?

Comments:

One bus manufacturer (2.1.1) commented that the requirement to test interior noise for every bus configuration manufactured, at approximately $250 per test, was an unwarranted additional cost, because the number of seats and type of floor and seat coverings have a very minimal effect on interior noise levels.

Response:

The Agency believes there is minimal additional cost associated with measuring the interior noise levels of buses. So that the testing can be more efficient and economical, manufacturers may want to conduct the interior tests at the same time that the exterior levels are measured. Further, the requirement for determining interior configurations has been changed from that proposed to allow manufacturers to subjectively determine the descriptor for the configuration they produce. Manufacturers would then rank them and test the noisiest configuration in the manner specified in the regulation. This system should substantially reduce the number of required interior tests.

4.4 Measurement Methodology

Issue: Will the measurement methodology be representative of interior noise emissions levels obtained during actual use?

Comments:

One bus manufacturer (2.1.11) commented that interior noise emission levels determined by the proposed test were very seldom obtained under actual driving conditions and that a characterization of the typical interior noise behavior of a vehicle was not possible with the proposed test. The manufacturer further commented that, due to the combustion process, the proposed interior noise test procedure was detrimental to diesel engines which have very good fuel economy and that the real nuisance to passengers under actual driving conditions was not found using the proposed interior noise test. The manufacturer suggested using a draft of ISO/DIS 5128, which is a testing procedure for evaluation of interior noise of buses. One citizens group (2.5.10) suggested that more than one measurement location might be appropriate for measuring interior noise. A school bus manufacturer (2.1.13) commented that Section 205.104-2(c) (test procedures for interior noise) incorporated the operating requirements of Section 205.104-1 (exterior noise test procedures), but that some were clearly inapplicable and should be deleted.

Response:

The selected bus testing procedure is designed to be representative of the noisiest mode of operation, without the necessity of having to test in each possible mode.

One manufacturer suggested the use of the ISO/DIS 5128 test procedures rather than the recommended procedures. Two major differences exist between the Federal and ISO test procedures: the number and location of measurement microphones and the mode of vehicle operation during measurement tests. The EPA test procedure specifies a single microphone location. For all buses, the microphone is positioned at a height of 1.25 meters (4.1 feet) above the bus floor and 0.5 meters (1.6 feet) from the nearest vehicle wall. The microphone is placed at a location near the vehicle's engine.

The ISO/DIS 5128 does not specify the exact number or location of the microphones but that "measuring points should be selected in sufficient number and in such a manner that the sound level distribution in the vehicle is adequately represented with respect to passenger ear locations." It is required that one measuring point shall be at the driver's position.

The EPA test procedure specifies that the vehicle shall be operated at wide open throttle acceleration. The ISO/DIS 5128 requires that sound levels be obtained at seven vehicle operational modes; five measurements at various constant speeds, one at idle, and one under full throttle acceleration.

The Agency concluded that the additional number of measurements required by the ISO/DIS 5128 introduces unnecessary complexity and some degree of non-standardization to the overall measurement procedure. EPA test data have shown that for typical operational modes (acceleration, deceleration, cruise, and idle) maximum interior sound levels are observed during the acceleration mode at locations closest to the vehicle's engine. The EPA test procedure identifies the maximum interior sound level as that which must be used to determine compliance with interior not-to-exceed standard.

The EPA has determined that only one microphone location is necessary, provided it is in the noisiest location. This requirement is an attempt to avoid overly burdensome testing requirements.

Section 205.104-2(c) has been changed to read as follows: "operated in the same manner as prescribed in §205.104-1(c)," rather than incorporating the entire section.

SECTION 5

SCHOOL BUSES: COMMENTS AND RESPONSES

5.1 General

Issue: Should school buses be regulated?

Comments:

Three commenters (2.1.8, 2.7.7, 2.5.14) concurred with the regulation of school bus noise. One bus manufacturer (2.1.8) suggested that school buses and intercity buses should be categorized like medium and heavy trucks, and regulated to the same 80 dB level.

Eleven commenters (2.1.7, 2.4.6, 2.7.4, 2.7.1, 2.7.12, 2.3.5, 2.1.13, 2.1.10, 2.1.3, 2.3.4, 2.7.11) opposed the regulation of school bus noise. Four (2.7.4, 2.7.1, 2.7.12, 2.7.11) indicated that school buses were not a major source of complaints. Three manufacturers (2.1.7, 2.1.10, 2.1.13) stated that none of the data tendered by EPA justified the regulation of school buses. A school bus manufacturer (2.1.3) claimed the noise regulation might conflict with other Federal rules and specifications while a trade association (2.3.5) requested complete exemption of school buses from regulation.

Response:

In the Noise Control Act of 1972, the Congress directed EPA to prescribe noise standards for newly manufactured products which, in the Administrator's judgment, are major sources of noise. Consequently, the Administrator identified the class of buses, which includes school buses, as a major source of noise on May 28, 1975 (40 FR 23105). Our studies showed that indeed noise levels of school buses can be reduced thereby deriving significant health and welfare benefits. Further EPA has not received any evidence which would indicate that school buses are no longer a major source of noise. Therefore we are mandated to issue this regulation.

The Agency received substantial eveidence that the cowl chassis used in over 90 percent of newly manufactured school type buses today are basically medium truck chassis. This regulation complements and is consistent with the April 13, 1976 Federal noise regulation for medium and heavy trucks. School buses are required to comply with 83 dB exterior/86 interior not-to-exceed noise level effective September 1, 1981 and a 80 dB exterior/83 dB interior not-to-exceed noise level effective September 1, 1985. The 1987 school bus standards have been deferred so that they can be made consistent with the standard for medium and heavy trucks (one more stringent than the presently established 1982 standard) which EPA intends to establish in the 1984 to 1985 time frame.

EPA believes that this Federal regulation is compatible with any existing rules and specifications.

5.2 Financial Impact on School Districts

Issue: What will be the financial impact on school districts?

Comments:

A school bus manufacturer (2.1.13) commented that the calculation of financial impact on school districts was underestimated. Another body manufacturer (2.1.3) stated that durable materials were used on school bus interiors to reduce vandalism, but they did tend to reflect rather than muffle sound, and if sound absorbing materials have to be added, both capital and maintenance costs to school districts would increase. One public school system (2.4.6) stated that the American Association of School Administrators had projected that the average increase in cost of school buses would be $2,139 above current prices and since recent OSHA regulations increased average prices by $1,700, school districts could not continue to bus children if the price of equipment continued to climb beyond their ability to replace and expand their transportation systems.

Response:

School districts are expected to experience very modest cost increases as a result of this regulation. For those districts which purchase buses which incorporate a cowl chassis (approximately 90 percent of the present day school bus population consists of this type bus), the Agency estimates an increase in unit bus costs of 0.02 percent for each of the two regulatory levels. These increased costs are primarily related to the Federal requirement for manufacturers to perform noise tests and maintain records.

Since the cowl chassis is basically a medium truck chassis without a cab, the Agency believes that the noise control features requisite to meet the bus standards are presently being applied on the production line to meet the current Federal noise standard for medium and heavy trucks. The Agency has strong reason to believe, based on noise tests and observation of manufacturing practices, that this technology is presently being applied to cowl chassis and that attendant costs are already being passed through to the user even in the absence of a bus regulation. Consequently, the Agency does not believe that added costs for noise control of chassis will be imposed on these school districts.

EPA estimates that when school buses (cowl chassis and non-cowl chassis buses) comply with the 80 dB exterior level in 1985, their annual operation and maintenance costs are expected to increase by about five percent. Based on a fleet of 25 school buses, which is considered average on a national basis, a school district's annual budget may be expected to increase about $1,258 (about 3/100 of one percent of the total budget per school district).

Non-cowl chassis buses will probably undergo engineering changes in order to comply with the bus regulation. These changes may increase the costs of this type of bus by 0.09 percent to meet the 83 dB standard and by an additional 0.2 percent to meet the 80 dB standard.

EPA believes that 86 dB and 83 dB interior noise levels can be achieved as a result of the reduced exterior noise and thus their attainment should occur at no additional cost.

5.3 Safety

Issue: Are noisy school buses safer?

Comments:

A trade association (2.3.5) stated that noisy school buses help prevent injuries, as children are more aware of moving buses and thus, can avoid them.

Response:

The regulation will not quiet buses to the extent that a moving bus will not be heard thus producing a safety hazard. Since the regulation places maximum limits on the interior noise of newly manufactured buses, it should benefit bus drivers attempting to hear passengers and, more importantly, hear outside traffic sounds (such as horns and emergency vehicle sirens) over the background interior noise level of the bus. This should have obvious safety implications.

5.4 Health and Welfare

Issue: How significant are the health and welfare benefits for school buses?

Comments:

A school bus manufacturer (2.1.10) commented that he believed the ENI for all buses is insignificant and that regulating school buses on the basis of sleep disturbance cannot be justified since he does not believe they operate when people are sleeping. The commenter also stated that he considers the probability of hearing damage from school buses to be nil because of the small exposure, and that speech interference is not a problem because passenger noise masks the bus noise. Another school bus manufacturerer (2.1.13) believes that sleep disturbance is not applicable to school buses.

One private individual (2.5.14) commented that she believed the regulation of school buses is important because current noise levels are such that her ears hurt and rang after riding a school bus.

Response:

The health and welfare model does not calculate the nighttime sleep disruptions for school buses. However, since school buses operate during the early morning hours when some people are sleeping, daytime sleep disruptions are calculated. These results are displayed in the Regulatory Analysis.

EPA does not claim that bus noise levels in and of themselves will cause hearing loss. However, the risk of hearing impairment becomes significant if the cumulative noise exposure from all sources over a number of years exceeds the equivalent A-weighted level of 70 dB. Presently, in school buses, children and drivers receive from ten (10) to well over 100 percent of their yearly allowable exposure due to the range of interior noise in these buses. This regulation will act to reduce the contribution of school bus interior noise to cumulative exposure, thus reducing the risk of damage to hearing (particularly to young children).

5.5 Costs vs. Benefits

Issue: Is it cost-effective to regulate school buses?

Comments:

One school bus manufacturer (2.1.13) stated that the cost and economic impact of the regulations greatly exceeded the expected benefits for school buses. The commenter also stated that the health/welfare benefits accrued from the regulation of school buses were less than with other bus types under the regulation, compared to cost. The commenter suggested a delay of the regulation for school buses until data and costs of other bus types could be gathered. A citizens group (2.5.10) commented that the costs do not justify the benefits for school buses.

Response:

The potential costs associated with a school bus noise emission standard were addressed in Section 5.2 of the Docket Analysis.

The benefits to be derived by reducing the exterior and interior noise level of school buses will be realized in a 26 to 46 percent reduction in the extent and severity of potential interference with human activities (such as conversing and sleeping) and 2 to 100 percent reduction in potential hearing loss risk for bus drivers and passengers depending upon the assumed range of daily non-bus exposures. For example, if the passenger's or driver's daily non-bus noise exposure level is 60 dB, the percent reduction, due to the regulation, of potential hearing loss risk would be around 100 percent. However, with a daily non-bus noise exposure level of 80 dB, the percent reduction would be around two (2) percent. EPA believes the benefits associated with reducing the noise of school buses to the 80 dB exterior and 83 dB interior levels are justified in light of the minimal costs.

5.6 Interior Noise

Issue: Will redesign be necessary to meet interior levels?

Comments:

One school bus manufacturer (2.1.13) commented that EPA assumed that for school buses with a forward-mounted engine, the interior regulations would require little modification of the bus body if a quieted chassis which met the exterior levels was utilized; and that this assumption was at variance with the manufacturer's experience. The commenter also questioned EPA's assumption that accessories would not require redesign to permit compliance. The manufacturer stated that to meet interior levels for school buses where accessories are often specified by purchasers would take a great deal of additional time.

Response:

EPA maintains that the appropriate exterior noise abatement treatments will bring the interior noise levels of most school buses down to the requisite levels. Our findings are based on noise testing data and engineering assessments. To date no new evidence has been offered to the Agency that quantifies additional costs or demonstrates that such costs will, in fact, be acquired.

SECTION 6

ECONOMIC IMPACT: COMMENTS AND RESPONSES

6.1 Cost Effectiveness

Issue: Is the regulation cost-effective?

Comments:

Six commenters (2.4.3, 2.3.2, 2.7.10, 2.2.4, 2.4.1, 2.5.11) remarked that the benefits of regulation did not justify the costs. One component manufacturer (2.2.4) stated that he believes that noise reduction estimates cannot be achieved without substantial changes in design, at a significant increase in cost. An intercity bus user (2.4.3) claimed the exterior standards of 80 dB and 77 dB were too stringent and not cost-effective. On the other hand, a city mayor (2.7.10) submitted that the standard seemed to support the economic feasibility arguments made by industry while ignoring the livability needs of urban areas.

Another three commenters (2.7.4, 2.6.4, 2.7.8) stated that the benefits did justify the costs involved with regulation. A member of the biomedical community (2.6.4) stated that the regulation seemed to balance health/welfare with economic and practical considerations. One city supervisor (2.7.4) indicated that her city and its residents were willing to pay increased costs for quieter buses.

Response:

The principal objective of the Federal government's noise regulatory actions is to achieve maximum health and welfare benefits giving consideration to technical feasibility the attendant costs and possible economic effects.

Technology is available to achieve the 83 dB regulatory level and the attendant costs are expected to be minimal, due to the fact that nearly all new buses currently sold in the U.S. have noise levels at or below the 83 dB level. To achieve the 80 dB level, some bus manufacturers will need to make changes to a percentage of their vehicles. Further reductions to the 77 dB level might be more costly because more sophisicated design changes might be needed. EPA estimates the list prices of buses may increase from 0.08 to 3.4 percent (depending on bus type and size) with a weighted list price increase for all buses of 0.6 percent. The Agency believes that this is a rather modest cost to achieve the health and welfare benefits expected from the regulation, which we estimate will significantly reduce the noise exposure of about 93 million people.

6.2 Costs to Manufacturers

Issue: Are the costs of compliance for manufacturers underestimated?

Comments:

One transit bus manufacturer (2.1.6) believes that, in general, EPA's cost figures were underestimated. Another transit bus manufacturer (2.1.8) suggested that the $15/hour direct labor and burden charges estimates were not valid for the automotive manufacturing industry, and that the EPA cost estimates of noise testing were extremely low; also, labor, equipment and facilities cost estimates were believed too low. The company further stated that EPA had erroneously assessed the economic impact of reducing bus noise to the proposed levels. A school bus body manufacturer (2.1.13) made the following two comments: "The cost of enforcement is understated--no costs for test facilities were included, nor were transportation costs to the facility, down time because of weather, or equipment malfunction. Salaries were much too low, and did not seem to include fringe benefits."

Response:

Incremental capital and maintenance cost estimates have been reexamined and revised to reflect additional information provided during the public comment period. Direct labor charges have been revised to reflect current industry averages based on information from independent test laboratories. The revised rates for a technician are $150/day or $18/hour; for an engineer $300/day or $37.40/hour. These costs estimates include all overhead costs and fringe benefits. Estimated testing costs per day are $600 for labor with four (4) hours per test. Transportation costs have been revised to $2.50/mile including gasoline, driver and other costs, for 20 miles or a total of $50. The revised maximum total test cost estimate is $350.

Down-time, because of weather or equipment malfunction, is not included as these costs are not expected to be incurred due to the Agency's 90-day test waiver period.

Costs for test facilities are not expected to be significant, as it is not necessary to construct special test facilities. Large concrete or sealed asphalt areas are readily available for rent at minimum cost, such as airfields or parking lots. Further, several of the bus manufacturers who are also truck manufacturers (presently required to comply with the Federal noise emission standards for trucks) may already have test sites.

6.3 Cost Analysis Methodology

Issue: Is the methodology for calculating costs valid?

Comments:

A transit bus manufacturer (2.1.6) stated that certain technology was taken out of context when discussing material costs, weight increases, and increased maintenance and labor costs. A school bus body manufacturer (2.1.13) pointed out that the regulations were not specific about which changes in design or construction were being costed and there also appeared to be no costs included for interior modification and these costs might be substantial.

Response:

Appendix G of the Regulatory Analysis delineates the specific noise abatement features and the associated labor and material costs assumed by the Agency for each bus type and for each technology level. The costs for these noise abatement features have been updated based on comments submitted during the docket and new information. The Agency's cost estimates were carried out on a "bus type" basis and thus reflect potential aggregate effects on that specific segment of the industry. Careful consideration is always given to the potential effects of planned Agency actions on individual manufacturers where available information may show such manufacturers to be in marginally unsound financial conditions; no individual bus manufacturer has indicated such a condition.

There are minimal to no costs (depending on the bus type) associated with the reduction of the interior noise to requisite regulatory levels; appropriate external noise abatement treatments are expected to bring about reductions in the interior noise levels.

6.4 Timeliness of Cost Data

Issue: Are the data used in the cost analysis outdated?

Comments:

One school bus body manufacturer (2.1.13) pointed out that the projection of ridership trends and costs from 1974 data was not valid because of current energy problems and concerns, and new major safety regulations, most of which add weight and reduce efficiency. A transit bus manufacturer (2.1.2) commented that data supplied to and used by EPA concerning economic impact of the proposed regulation was no longer valid because numerous factors have changed significantly since the data were prepared in May 1976.

Response:

The Agency received no new cost data to substantiate the claims of the two commenters during the public comment period. Thus, there were no changes made to the original cost assumptions. We did reexamine all cost and economic data and based on the Agency's assessments and estimates, adjustments were made including the conversion of the cost figures to 1978 or 1979 dollars wherever possible.

6.5 Operating and Maintenance Costs

Issue: What is the magnitude of operating and maintenance costs resulting from regulation?

Comments:

One industry association (2.3.2) pointed out that increased maintenance costs resulting from the proposed regulation were extensive, and would have a larger impact than capital costs because operating expenses were already rising nationally at an alarming rate. This commenter further stated that EPA's estimate of operating costs was too low. Another association (2.3.3) stated that eliminating the deceleration test from the regulation would help reduce the testing costs. An individual (2.7.8) commented that he believed that the operational costs would not be significantly greater under the proposed regulation. A school bus manufacturer (2.1.10) stated that because of the absolute compliance philosophy of the proposed regulation, it would be absolutely necessary for manufacturers to require shorter inspection and replacement periods to assure that noise control items were replaced before they failed, and thus, maintenance schedules would be considerably more expensive than they were in the past.

Response:

From the economic studies the Agency has conducted, EPA estimates that for buses to meet the most stringent level of the regulation, the increased maintenance costs per year for transit or intercity buses would be approximately $595 and for school buses it would be approximately $46. EPA estimates the incremental cost per vehicle mile (this includes capital, operating and maintenance costs) to range from 0.2 cent to 0.7 cent for intercity buses, from 0.8 cent to 3.2 cents for transit buses and from 0.004 cent to 0.4 cent for conventional school buses.

6.6 Seat Loss

Issue: What are the costs related to reduced seating capacity on the Advanced Design Buses (ADB's)?

Comments:

An industry association (2.3.2) stated that they anticipated a loss of two to four seats due to new design needs. This would require some transit systems to replace lost seats one-for-one, and others, one for every two lost, which may not be economically feasible for some transit operators. It was also stated that the estimated annual cost per bus seat per year was $113,000 to $950,000. A bus user (2.4.4), however, disagreed with the previous commenter's (2.3.2) testimony and stated that its estimated seat-loss costs were too high. Another industry association (2.3.3) pointed out that the economic impact of seat loss was incorrect as it only evaluated the initial acquisition cost of a seat, and ignored loss of productivity to the operator, which was a major economic penalty because a 5 to 10 percent seat loss would require a comparable increase in the number of buses and the number of operating personnel. A transit bus manufacturer (2.1.8) stated that the economic impact analysis failed to consider adequately the effect of removing passenger seats to make room for added noise control equipment. In addition, it was stated that the EPA methodology for assessing economic impact of seat loss was incorrect, as it only considered capital costs, and not the more significant loss of productivity. A second transit bus manufacturer (2.1.2) also suggested that EPA underestimated the economic impact of seat loss.

Response:

EPA conducted a thorough review of the potential reduced seating capacity in the Advanced Design Bus. We have concluded, based on an engineering assessment of the potential noise control requirements, that the ADB can be readily modified to accommodate requisite noise control components through rearrangements of the engine compartment. The Agency believes that this can be achieved without any seat loss. Further, the modification should not require major structural design changes and thus, should not result in significant costs. This subject is discussed in greater detail in Section 5, Noise Abatement Technology and Section 7, Economic Impact, of the Regulatory Analysis.

The subject of potential seat loss on the Transbus cannot be addressed until definitive Transbus design specifications are available.

6.7 Energy Conservation

Issue: What will be the impact of the regulation on fuel consumption?

Comments:

An intercity bus manufacturer (2.1.12) stated that the EPA failed to consider the impact of fuel consumption as a result of its proposed regulations and that the consumption of fuel far outweighed any public health/welfare benefit accruing to intercity bus passengers. One industry association (2.3.1) believes that requiring low exterior noise levels on intercity buses would adversely affect fuel economy--as much as 10 percent for the 75 dB level. A bus component manufacturer (2.2.1) requested that all proposed regulations should give special consideration to fuel-saving devices, because of the nation's energy shortage, such as the clutch fan, which testing had proven could save as much as 10 percent on a vehicle's fuel consumption. A regional governmental commission (2.7.14) opposed the proposed regulation because fuel economy would decrease.

Response:

The Agency has given careful consideration to possible increases in vehicle weight due to noise features and to the potential attendant changes in fuel use. EPA's investigations indicate that the expected noise control measures applied to school, transit and intercity buses should result, for the most part, in improved performance or better fuel economy. This should offset either partially or totally any potential increases in fuel consumption due to added weight. An exception to this case is the Advanced Design Bus which might experience a potential reduction in fuel economy of 2.5 percent.

In light of the rapidly changing fuel costs, the Agency has not attempted to convert the anticipated percent increases or decreases in fuel consumption into dollars. A detailed discussion of this subject is presented in Section 7 and Appendix G of the Regulatory Analysis.

EPA believes that gasoline engine powered school buses may realize a 5.0 percent decrease in fuel consumption as a result of the incorporation of an optimized cooling system or a thermostatically controlled fan. Diesel powered school buses may realize a 6.0 percent decrease in fuel consumption based on the use of thermostatically controlled fans, reduced fan horsepower requirements and the use of turbocharged engines. On the average, EPA does not anticipate any increase in fuel consumption of school buses.

The "New Look" design transit buses may experience a 5.0 percent improvement in perfomance. However, due to the added weight of the noise control components, this might result in reduced fuel economy of the order of 1.6 percent.

Presently, the Advanced Design Bus (ADB) meets the 83 dB exterior standard and no improvements in performance due to noise control features are anticipated. The maxiumum potential reduction in fuel economy for the ADB is estimated at about 2.5 percent to meet the most stringent standard.

For intercity buses to meet the most stringent level of the regulation, turbocharging will probably be installed resulting in a 2.0 percent increase in performance. However, the fuel economy could be reduced by 1.5 to 2.5 percent due to the increased weight of the noise abatement treatments.

EPA believes that the estimated reduction in bus fuel economy will, for the most part, be offset by the application of energy-saving, noise reduction components (such as turbocharging and installation of clutch fans). However, in keeping with the Agency's policy, EPA's estimates of costs to comply with the standards do not take credit for the fuel savings of these noise control components. The Regulatory Analysis presents a "worst case" situation.

6.8 General Economic Impact

Issue: What will be the economic impacts of the regulation on exports and employment?

Comments:

An intercity bus manufacturer (2.1.5) commented that since it was a small manufacturer, and producing buses of several different basic designs was prohibitive, a 3.2 percent increase in cost, or costs in excess of $3,000, would seriously affect its ability to export buses. The commenter remarked that it was a large minority employer, and without Federal subsidy, the proposed regulation would affect the economic well being of many employees of Spanish origin.

Response:

Manufacturers may continue to produce unregulated equipment for export if it is labeled "For Export Only". The available noise control technology for meeting the regulation does not require extensive redesign and can be omitted from the production destined for export sale.

Prior to promulgating a regulation EPA assesses the various economic impacts such as potential unemployment. Assuming employment impacts follow the general trends of demand for buses, the regulation might result in unemployment of less than 2.8 percent for the total industry. Most of those unemployed will have skills similar to those producing other modes of transportation. Also there might be some modest increases in personnel needed to design, build, install noise control components and conduct the necessary noise testing. EPA anticipates that these job positions will sufficiently offset any unemployment.

6.9 Economic Impact on Bus Users

Issue: What will be the impact of increased fares on bus passengers?

Comments:

One bus user (2.4.3) predicted a 2 percent fare increase. They stated that because intercity buses received no subsidies, the elasticity of demand was very price sensitive and that since buses were the most fuel efficient means of transportation, any fare increase would not be in the interest of energy conservation. An industry association (2.3.1) commented that the costs of reaching and maintaining the proposed levels would be great, the proposed testing procedure would require even greater expense, and bus passsengers, most of whom were low-income, would ultimately pay. An intercity bus manufacturer (2.1.12) stated that the EPA had failed to consider the substantial cost impact resulting from the proposed regulations, particularly the adverse impact upon the transportation disadvantaged - senior citizens. A regional governmental commission (2.7.14) did not support the regulation because fares would increase. One individual (2.5.11) remarked that those who would bear the brunt of cost increases were those who could least afford it.

Response:

The Agency believes that the costs of the regulation will be passed along to the public gradually over time, as old worn-out buses are replaced with new, quieter vehicles. Considering that the average life of new buses is about eleven years, it may be fourteen to nineteen years before fleets are composed entirely of buses meeting EPA's most stringent noise limit and the full costs of quieting are passed on to the public in the form of increased fares and school budgets. EPA expects the list prices of buses to increase from 0.08 to 3.4 percent (depending on bus type and size), with a weighted average list price increase for all buses of 0.6 percent. Assuming a future fleet of buses all meeting the most stringent applicable noise standards, EPA estimates that the riders of transit buses might see a fare increase of up to 1.3 percent. Thus a ride which costs 50 cents, would cost about one-half cent more. Intercity bus fares are not expected to rise more than 0.7 percent. As an example, if the fare from Washington, D.C. to Chicago were $74.85, as it is now, it would increase about 52 cents. The "typical" school district (with an average fleet of 25 school buses) may have to increase its annual budget by 0.03 percent.

6.10 National Uniformity of Treatment

Issue: Is it not more cost-effective to control the noise at the Federal level than at the local level?

Comments:

One commenter (2.7.8) stated that Portland would be willing to pay higher acquisition costs for quieter buses. A city supervisor (2.7.4) pointed out that the cost of reducing noise levels is higher if it is done in the community rather than on the national manufacturing level.

Response:

The Noise Control Act states in Section 2(a)(3) "that, while the primary responsibility for control of noise rests with State and local governments, Federal action is essential to deal with major noise sources in commerce control of which require national uniformity of treatment." If the "cost to quiet" is distributed across the national bus population this will result in lower per unit costs at the State and local level.

6.11 Federal Funding

Issue: Is there Federal funding available to comply with the regulation?

Comments:

One city supervisor (2.7.11) suggested that Federal monies should be associated with the proposed regulations because when they are implemented, localities won't be able to bear the costs or fare increases even though they may want strong regulations. A private individual (2.5.12) stated that it would be best to have increased subsidies to support noise control, but if fares must increase he would be willing to pay the additional cost for quiet. Another individual (2.7.8) said that the regulations were going to "freeze and kill" private research and development because there was no incentive to go to lower noise levels. A bus user (2.4.3) commented that without subsidies to meet the proposed standards, the cost was "prohibitive", and exterior standards for intercity buses were not in the best national interest. It was further stated that intercity buses should receive Federal subsidies if they have to comply with a Federal noise standard. One Federal department (2.8.2) stressed that the Low Noise Emission Product (LNEP) program was not desirable for transit buses because of the complex funding and specifications involved.

Another private individual (2.5.20) recommended that there should be experimental/prototype buses placed in the fleet to demonstrate improved noise, comfort, and ventilation. Also a program be implemented to retrofit/modify existing buses. He proposed that San Francisco be the trial ground for a pilot project to improve transit buses. It was further recommended that EPA set up a university-type research program to solve some of the vehicle problems, and that EPA should have a national contest for inventors, for instance--$100,000 for a 60 dB bus.

Response:

Under the provisions of the Noise Control Act, which authorizes EPA to regulate major sources of noise, there are no provisions which would permit EPA to subsidize persons or organizations impacted by noise regulations. However, EPA has sponsored and funded some research, development and demonstration programs, such as the "Quiet Truck" program as well as a bus retrofit program in Portland.

Higher equipment costs may result in additional financial burdens placed on communities; however, much of this burden is alleviated by the 80 percent subsidy paid by the Urban Mass Transportation Administration for capital equipment costs of urban transit systems. A majority of the communities purchase buses primarily as replacements for their existing fleet, and the cost impact will be felt gradually over a period of several years.

In addition, EPA has been authorized to conduct the Low Noise Emission Program which provides economic incentives for producing products currently regulated for noise emission by EPA. Manufacturers who can meet the noise emission criteria for the LNEP can sell these products to the Federal government under very favorable procurement procedures.

purchase buses primarily as replacements for their existing fleet, and the cost impact will be felt gradually over a period of several years.

In addition, EPA has been authorized to conduct the Low Noise Emission Program which provides economic incentives for producing products currently regulated for noise emission by EPA. Manufacturers who can meet the noise emission criteria for the LNEP can sell these products to the Federal government under very favorable procurement procedures.

SECTION 7

TECHNOLOGY:
COMMENTS AND RESPONSES

7.1 Capability of Industry to Meet Standards

Issue: Is there a lack of available technology to meet the proposed standards?

Comments:

A local government noise official (2.7.8) stated that the technology exists today for the production of a bus whose noise levels are in the very low 70s, compatible with HUD's housing requirements. One bus user (2.4.4) stated that American industry could manufacture a quiet bus - it had already been done. Two bus manufacturers (2.1.7, 2.1.10) said the EPA did not demonstrate that technology existed to meet the 77 dB level, regardless of costs.

Response:

Section 6 of the Noise Control Act requires that the regulation take into account "the degree of noise reduction achievable through the application of the best available technology, and the cost of compliance." For the purposes of this regulation, best available technology is defined as that noise abatement technology available which produces the greatest achievable, meaningful reduction in the noise produced by buses. EPA considers that the level "achievable through the application of the best available technology" is the lowest noise level which can be reliably predicted based on engineering analysis of products subject to the standard that manufacturers will be able to meet by the effective date, through the application of currently known noise attenuation techniques and materials. In order to assess what can be achieved, EPA has: (1) identified the sources of bus noise and the levels to which each of these sources can be reduced, using currently known techniques: (2) determined the level of overall bus noise that will result; (3) assured that such techniques may be applied to the general bus population; (4) assured that such techniques are adaptable to production line assembly; and (5) assured that sufficient time is allowed for the application of this technology by the effective dates of the standards. The regulatory levels are based on not only on the health and welfare benefits but also considerations of the availability of technology and anticipated cost of utilizing the technology.

The effective date for the 77 dB level has been designated, based on industry and Agency assessments, far enough into the future to allow manufacturers adequate time to tool up and apply noise control technology appropriate to the noise standards without significant disruption to the industry. The feasibility of appropriate noise control techniques for buses has, in fact, been demonstrated by Portland, Oregon. They have retrofitted buses with practical noise abatement treatments which reduce their noise emission levels by 3.5 dB.

7.2 Noise Control Design

Issue: What are the technical ramifications of noise control design?

Comments:

One transit bus manufacturer (2.1.6) stated that the Agency did not fully consider the ramifications of applying noise control components and technology to buses. Another transit bus manufacturer (2.1.8) commented that for EPA to suggest that higher (exhaust) back pressures might be allowable on a bus chassis rather than on a comparable truck chassis was not correct. The manufacturers further stated that in their quest for lower noise levels, EPA should not suggest techniques which will lower quality of service. It was also stated that EPA had not adequately assessed the technology for reducing bus noise to the proposed levels. An industry association (2.3.2) stated that "not-to-exceed" levels would require over-design by about 2 1/2 to 3 dB, because of production variations. A local government official (2.7.3) believes the proposal was justified in focusing mostly on engine-related noise, since tire noise was not significant in urban areas due to the lower speeds at which buses travel in these settings. A private individual (2.5.20) stated that vertical exhaust stacks helped reduce noise and that Schwitzer thermostatically-controlled fans helped most for the money. A bus manufacturer (2.1.12) stated that the requirements placed on the manufacturer to achieve lower noise emissions were "complicated, unrealistic and vexatious."

Response:

The technical aspects of the proposed noise control design for meeting regulatory levels has been carefully reviewed by the Agency in light of the comments received in the docket. The statement that the bus manufacturer (2.1.8) takes issue with stated that most school buses do not frequently operate at wide open throttle positions; therefore, it may be possible to utilize higher back pressures. The noise control technologies discussed in the Regulatory Analysis are illustrative examples of how one might proceed in lowering bus noise levels. It is expected that most manufacturers will develop their own approach which best suits their particular production and marketing situations; the noise regulation establishes performance standards not design standards.

The noise emission standards have taken into account a production and noise testing variability of 2 dB. Based upon our assessment of available technology, we anticipate that production vehicles will have noise levels at least 2 dB below the standard.

7.3 Redesign of Bus Features

Issue: Will the suggested noise control technology require redesign of many bus features?

Comments:

A bus user (2.4.4) stated that major advances in noise reduction would only take place through the redesign of the engine compartment. One industry association (2.3.3) pointed out that much of the technology purported to be readily available was based upon spacing that existed in current and "Advanced Design" buses.

Response:

EPA does not believe that major redesign of the engine compartment will have to be made in order for buses to meet the specified noise standards. However, the Agency acknowledges that some minor modifications of the engine compartment on some buses may be necessary. This was taken into consideration in both the cost and economic assessments.

The Agency has carefully assessed the noise abatement technology required by the Advanced Design Buses (ADB). In order to meet the most stringent level the ADB may have to rearrange the engine compartment and possibly relocate the cooling system. However, we do not believe that this will necessitate major redesign of the engine compartment or interior bus structure or should this result in seat loss.

7.4 Modular Theory

Issue: Is the modular approach to noise level reduction appropriate?

Comments:

An industry association (2.3.3) stated that the "modular theory" EPA used in assessing the "state of the art" was speculative and subject to errors related to interaction of sources, system installation effects, accessory placement and impact on vehicle operational requirements. One bus manufacturer (2.1.2) disapproved of the "modular theory" technology used to define "state-of-the-art". A second bus manufacturer (2.1.8) commented that the modular approach to noise level reduction was highly speculative and subject to inaccuracies.

Response:

The "modular approach" cited is simply vehicular noise source identification and quantification. The data appearing in the Regulatory Analysis is based upon measured sound levels. It can be considered representative for the vehicles from which the data were obtained. This "modular" procedure, while subject to some uncertainty (as is any analytical or empirical analysis), is universally accepted as a credible method for measuring noise levels, and is used frequently in noise control engineering studies and by vehicle manufacturers.

7.5 Insulation Materials

Issue: What is the durability and flammability of recommended insulation materials?

Comments:

An industry association (2.3.1) posed the question: "How long does EPA estimate that the recommended type of noise insulation in the engine compartment can be used before its usefulness is marginal, considering the varying bus operating characteristics?" A component manufacturer (2.2.3) recommended that absorbant materials should be prohibited under the engine because of fire hazard from wicking effect. The manufacturer stated that this risk could be alleviated with a thin film of mylar, but this may reduce the acoustical absorbing properties from 6 to 8 dB down to 1.5 to 4 dB; mylar is also fragile, and of unknown durability. Assuming the noise reduction useful life of the engine compartment insulation is short, the manufacturer questioned whether EPA had calculated the cost-benefits of the frequency of insulation replacement, considering that the engine would probably have to be removed to accomplish the replacement.

Response:

In noise control demonstrations of underground diesel-powered vehicles for the U.S. Bureau of Mines, engine enclosure treatments were evaluated. Materials composed of glassfiber with a thin film wrapping over which expanded or perforated sheet metal is placed, were considered "excellent" in tests conducted for cleanability, resistance to oil absorption, resistance to abrasion and penetration and flammability. The Bureau of Mines test results are particularly significant considering the hostile mine environment where flammability concerns are paramount.

The sound absorption material (glassfiber) covered with a thin film wrapping and expanded metal facing was found to be only 0.7 dB less effective than unprotected glass fiber. In the Department of Transportation (DOT)

Quiet Truck Program, a Freightliner truck was fitted with an engine compartment treatment consisting of glass fiber, an "oriented" plastic netting, thin film wrapping, and a perforated sheet metal covering. This treatment has been tested in actual field service. Engine compartment sound absorption treatments--consisting of approximately 1.5 inches absorptive lining protected by a thin film wrap and expanded metal facing--are being used in European transit bus routinely. The use of these noise control treatments do require reasonable maintenance procedures to protect the components. EPA has calculated the costs of noise reducing technology and the maintenance of it in Section 7 of the Regulatory Analysis. The costs of installing and maintaining insulation materials are included in Appendix G.

The Agency does not require manufacturers to incorporate any specific noise control features. The Agency's technology studies were performed only to determine the feasibility of reducing current bus noise emissions levels. These levels were weighed against the anticipated health and welfare benefits and the attendant costs and economic impacts. Thus, the manufacturer is at liberty to design or implement any noise control measures that he deems appropriate to quiet the product to the regulated level.

7.6 Diesel Technology

Issue: Is noise control technology for diesel buses different than for gasoline buses?

Comments:

An industry association (2.3.3) stated that EPA erroneously assumed that all technology generated for diesel-powered vehicles was directly applicable to gasoline-powered vehicles.

Response:

The Agency considered the differences in noise control features for diesel-powered vehicles and gasoline-powered vehicles and concluded that many of the feasible noise control measures are the same for both types of vehicles. For example, the noise control treatments for the exhaust and cooling systems are the same. The technology section of the Regulatory Analysis has been revised to clarify the differences in noise control technology between diesel and gasoline-powered vehicles.

7.7 Document Review

Issue: Should EPA re-examine technical issues?

Comments:

An industry association (2.3.3) recommended that EPA re-examine technical issues as part of an overall document review.

Response:

EPA has conducted an extensive document review and has re-examined all pertinent technical issues. The technology section of the Regulatory Analysis has been revised to reflect all new findings, and these findings represent the best available technical information the Agency can obtain.

SECTION 8

ENFORCEMENT: COMMENTS AND RESPONSES

8.1 Production Verification (PV)

Issue: Should the Production Verification (PV) requirements be revised?

Comments:

Two bus manufacturers (2.1.8, 2.1.12) commented that many of the Production Verification requirements were arbitrary and unrealistic and that the determination of product configurations was totally unclear. A third bus manufacturer (2.1.13) commented that the Section 205.105 requirement (each configuration be subject to a PV test every year) would impose a burden far in excess of any conceivable benefit. The manufacturer recommended that this Section be modified to require retesting only when significant noise affecting changes were made, or if a model met standards when tested, but as so tested would not meet the standards going into effect in the year in question. The manufacturer also commented that the Section 205.105.4 requirement, to file a report, was overly burdensome, especially as applied to school bus manufacturers with a multiplicity of product configurations. The manufacturer further stated that the labeling requirements of Section 205.15-11 and the warranty provisions of Section 205.108-1 should be sufficient to ensure compliance and that if a report was required, then Subsection (b)(3) should be modified to limit the information required on any one PV report to that descriptive information applicable only to the configurations covered by that particular PV report. A manufacturer related to the bus industry (2.2.5) stated that the excessive administrative costs that would be encountered because of product verification and required data, and control and scrutiny of records would add to the costs.

Response:

Revisions have been made to §205.105(b) which greatly reduce the total number of Production Verification (PV) tests. The revision deletes specific interior configurations and allows manufacturers performing interior PV to test their loudest interior configuration based on their own best technical judgment.

PV has been chosen as a reasonable system of demonstrating compliance at minimum cost and burden to the manufacturers. PV allows the manufacturer to conduct representative testing to demonstrate compliance and does not require any certification by EPA. Such representative testing allows manufacturers to test as few as one configuration per category to demonstrate compliance for the entire category. The regulation also contains a section allowing the Agency to grant production verification carry-over to some configurations during subsequent model years. This provision further reduces the resources necessary to perform compliance testing.

Manufacturers are allowed considerable latitude in preparing their PV reports. EPA does not require that a specific format be followed, nor does it require that information be resubmitted when tests on additional configurations are reported. Please refer to §205.105-4 for the items required from all manufacturers during the production verification process and specifically paragraph (c), which explains that previously submitted information need not be resubmitted.

The Agency requires all configurations represented by the PV tests to be described so that sufficient information will be available to carry out proper surveillance of the industry and effect appropriate enforcement actions.

8.2 Batch Acceptance

Issue: Errors appear to exist in the tabulations.

Comments:

One bus manufacturer (2.1.7) stated that in Table III of the proposed regulation the "Acceptance No." and "Rejection No." tabulations for code letter B appeared to be erroneous.

Response:

The Selective Enforcement Audit (SEA) provisions have been revised and a new sampling scheme has been adopted. Under the new scheme, which is no more stringent than that proposed, vehicles are selected and tested sequentially until a pass-fail decision for the SEA is made. All vehicles selected for the SEA are tested, thereby eliminating the time consuming procedure of random selection used in the old plan. The scheme also permits quicker completion for SEA's of categories and configurations with low production volumes. Overall, the new SEA scheme requires fewer resources of manufacturers and EPA, yet it places no additional risk of SEA failure on the manufacturer.

8.3 Two-Stage Manufacturing

Issue: What are the compliance procedures for two-stage manufacturers?

Comments:

An industry association (2.3.3) commented that the actual noise emission of a vehicle could only be determined after its completion and EPA should establish that the final vehicle manufacturer was responsible for PV, because otherwise some incomplete vehicles could be covered by both truck and bus regulations. It was the general view of two bus manufacturers (2.1.2, 2.1.8) that additional clarification was required of test vehicle verification responsibility and they stated that the compliance methodology should hold the final vehicle manufacturer responsible for compliance. One bus manufacturer (2.1.3) questioned whether school bus body manufacturers would be responsible for meeting the interior noise standard if the chassis that the body was mounted on was manufactured prior to the effective date of the regulation. The manufacturer further stated that the noise regulation responsibility should be on the chassis manufacturer, not the body manufacturer. They cited the National Highway Transportation Safety Administration's regulation for "Vehicles Manufactured in Two Stages", 49 CFR, part 558, which recommended that the manufacture date of the chassis, which is the noise producing medium, should determine compliance with the regulation. Another commenter (2.1.7) stated that the assignment of Production Verification to manufacturers of cowl-chassis was unreasonable and incorrect, as only the testing of completed buses could determine compliance. They further stated that the proposed regulation could subject some chassis to two regulations (truck and bus) depending on the vehicle's final configuration, unless the regulation was changed so that only the final stage manufacturer was responsible for the noise level. Another manufacturer (2.1.13) stated that, concerning Section 205.105-3, the whole subject of separate configuration identification and testing would place unreasonable burdens on manufacturers of school bus bodies. Concerning Section 205.105-1(d), they commented that an operating procedure common in the school bus manufacturing industry might cause problems under this Section if the delay requested was not granted because it was standard procedure for school bus manufacturers to constantly maintain a stock of vehicle chassis for use in the production process. Often these were held pursuant to bailment of other agreements until their use, and thus were not "sold" until such time as the completed bus was sold. Thus, the situation might arise where a chassis was delivered early in 1981 and hence, was not subject to regulation but was not used to manufacture a completed bus until after September 1, 1981.[1] Not only did this present questions of certification, but requiring a bus to meet interior standards if it was built on a chassis not required to have the equipment necessary to meet exterior standards might impose unreasonable burdens on body manufacturers. A similar situation would arise on September 1, 1985 and September 1, 1987. Therefore, the manufacturer stated that it was imperative that this section be modified to provide that no body manufacturer be held to any higher level of regulation than that which would apply to the chassis on which he mounted the bus body.

Response:

The Agency has determined that the manufacturer who assembles the major drive train components to the extent that testing for exterior noise levels can take place, must Production Verify (PV) the vehicle with respect to the exterior standard. Therefore, the manufacturer who completes a "cowl chassis" (defined in the regulation as a drivable chassis with a partially or fully enclosed engine compartment) and sells it to a subsequent manufacturer for incorporation into a bus must complete the exterior PV testing. Interior PV testing on this type of vehicle (a bus incorporating a cowl chassis and completed by a subsequent manufacturer) is the responsibility of the subsequent manufacturer (body mounter).

Responsibility for noise emission labeling is apportioned almost identically to the manufacturer responsible for PV testing. The manufacturer

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1. Dates have been altered from actual submission to coincide with final regulatory dates and thus be an accurate illustrative example.

who must perform exterior PV testing is responsible for labeling the vehicle as to compliance with exterior noise emission standards. The manufacturer who must perform interior PV testing is responsible for labeling the vehicle as to compliance with interior noise standards. However, the regulation has been modified slightly to accommodate situations where different manufacturers perform exterior and interior PV testing; the manufacturer who does exterior PV testing may transfer the exterior noise emissions label to the subsequent manufacturer. That subsequent manufacturer must then mount both the first manufacturer's exterior noise emission label and his own interior noise label in the operator's compartment when the bus is completed.

In the case of buses constructed completely by a single manufacturer, that single manufacturer is responsible for both exterior and interior PV testing and labeling. Similarly, a manufacturer who completes a bus upon a chassis not meeting the definition of "cowl chassis", e.g., a non-drivable bare chassis, must comply with both the exterior and interior PV testing and labeling requirements.

8.4 Maintenance Instructions

Issue: Should maintenance instruction requirements be structured to prevent unfair competitive advantage?

Comments:

One manufacturer (2.2.5) commented that Section 205.108-3, Instructions for Maintenance, Use and Repair, should be reworded to prevent unfair competitive advantage, i.e., not to make all parts and tools look exactly like the original. Another manufacturer (2.1.6) stated that all references to "owner's manual" should be changed to "maintenance manual."

Response:

Section 205.108-3(a)(3) specifically states that the instructions must not be used to secure an unfair competitive advantage nor restrict replacement parts to original equipment, and remains written as proposed.

The term "owner's manual" is intended to designate the documents the manufacturer uses to convey necessary consumer information, including maintenance information, operating instructions, warranties, as well as noise and other regulatory requirements.

The manufacturer may include the information required by this regulation in any of his major documents provided such information is securely bound to those documents. The term "owner's manual" is retained in the regulation.

The Agency plans to continue this "oversight" strategy, as used in other EPA noise regulations, in the enforcement of the bus regulation.

Section 205.103(a)(2)(ii) has been changed to require that the records for individual test vehicles need contain only the noise related repairs and maintenance performed prior to the testing of the vehicle at or below the standard.

It is the Agency's position that the required information in production verification reports is public information and that they contain no material which should be treated as confidential business information. The vehicles represented in the reports are either in commerce or about to be distributed and anyone may procure and test a vehicle to ascertain the noise level. Anyone may also visually inspect a vehicle to determine the noise attenuation equipment.

Manufacturers have the right to request confidentiality on any documents they submit. EPA will follow the procedures set out in 40 CFR 2.201, et seq, should it decide to contest this confidentiality claim.

8.5 Maintenance of Records

Issue: Are the reporting requirements too burdensome?

Comments:

One bus manufacturer (2.1.13) commented on Section 205.103(a)(2)(ii). If this subsection referred to maintenance on vehicles to be performed prior to testing, then the subsection should be changed to specifically require that records be kept only for repairs, maintenance, etc., performed prior to the PV and/or SEA test; if that was not what the subsection meant, then, the entire subsection should be deleted as being too broad and burdensome. The manufacturer also commented on Section 205.103(b). The data required by the subsection, and others, to be submitted by manufacturers to EPA, must be afforded some confidentiality, i.e., access to any data which might affect commerce should be restricted to those with a definite need to know for the express purpose of enforcing noise regulations. Two other bus manufacturers (2.1.8, 2.1.12) commented that EPA's record retention provision required the manufacturer to maintain unnecessary records and also placed a burden for recordkeeping, compliance, engineering and testing on the manufacturer rather than EPA assuming those responsibilities itself.

Response:

The Agency has chosen to approach the requirements for testing, recordkeeping, and administration of the regulation from the standpoint that the manufacturer will be responsible to comply in such a manner that only minimal EPA involvement will be necessary. EPA strives to avoid interference with the manufacturer's production processes and to minimize involvement in their normal operations.

8.6 Labeling

Issue: Should the labeling requirements be modified?

Comments:

One bus manufacturer (2.1.12) commented that Section 205.105-11 should be modified to permit the use of a single label to evidence compliance with both the interior and exterior regulations and that such combinations would be especially necessary in cases where buses were manufactured in two stages, i.e., a bus body was mounted on a chassis (meeting the definition of a vehicle) produced by another manufacturer. The manufacturer stated that, in fact, until the body manufacturer completed his manufacturing, there was not even an "operator's compartment" as required by Section 205.105-11(a)(2). A second manufacturer (2.1.7) stated that the day, month and year on the label were not justified and that the calendar year of manufacture should suffice for EPA's records, and should avoid the complexity of tracking vehicles in the assembly process. Month and year requirements posed the same problems. The manufacturer also stated that the requirement that the manufacturer attach a label to the operator's compartment was unreasonable for manufacturers of incomplete vehicles, since there was no compartment. If manufacturers of incomplete vehicles were assigned PV responsiblility, such manufacturers should only be required to transmit the label information through the owner's manual or other documents forwarded with the vehicle.

A local government official (2.5.3) stated that the regulation should include labeling of in-use standards to aid in local enforcement.

Response:

Both labels are still required to be used. EPA does not require a second stage manufacturer to label a vehicle for compliance with a standard for which another manufacturer is responsible. The regulation has been modified to allow the label to be transmitted to the secondary manufacturer, so that both can be mounted in the operator's compartment when it is completed.

In response to docket comments and to the decision in the Chrysler et al v. EPA case, the regulation has been changed to require that only the year of manufacture be shown on the label, provided a number of conditions are met. If the conditions are not met, then the month as well as the year of manufacture must appear.

In order to display only the year of manufacture on the label, the manufacturer must maintain and be willing to provide to EPA on request, such records which enable EPA to ascertain the month of manufacture. Because the label and manufacturer's supplied information will indicate the month and year of manufacture, the standard applicable to that vehicle may be easily determined. This date also conveys the requirement to comply with an Acoustical Assurance Period of two years/200,000 miles.

It is left to States and localities to establish usage and operational standards.

8.7 Warranty

Issue: Are the warranty provisions too broad?

Comments:

One bus manufacturer (2.1.8) commented that the warranty provided in the regulation failed to consider the realities of bus manufacturing and that the proposed requirements dealing with in-use standards should be stricken from the final regulation. Another manufacturer (2.1.6) stated that the warranty section did not spell out the duration of the warranty, the nature of remedies available, or how subsequent purchasers (after the initial one) could enforce the warranty without a contract with the manufacturer. A bus component manufacturer (2.2.5) questioned EPA's authority for "in-use" warranty standards as the Noise Control Act limited regulations to "time-of-sale" standards and recommended that an in-use test should be used instead of in-use warranty. A bus manufacturer (2.1.13) stated that without modification, Section 205.108-1 for all practical purposes would require each bus or vehicle manufacturer to test "each and every" vehicle produced and to keep the test records "virtually forever". It would be only in this manner that manufacturers could ever hope to prove that any particular vehicle met all warranty conditions. This would totally defeat the Agency's concept of only requiring the testing of selected vehicles in an effort not to impose unrealistic burdens. Therefore, the manufacturer strongly urged the Agency to add language to the section to the effect that "compliance with the requirements of Section 205.105 of this subpart shall be prima facie evidence of compliance with the terms of this warranty." The manufacturer also stated that any information submitted pursuant to Subsection (b) should be afforded confidential treatment. Another bus manufacturer (2.1.7) stated that the imposition of warranty liability on manufacturers of incomplete vehicles for compliance at the time of sale to the first retail purchaser, even though such a manufacturer may have no control over the completion of the vehicle, was arbitrary and beyond the authority granted to EPA. Another bus manufacturer (2.1.12) commented that the warranty provisions were too broad and unlimited; that they failed to consider poor maintenance, abuse or improper use, tampering or other occurrences which were difficult to prove; and that the operator's maintenance records might not provide sufficient documentation. The manufacturer stated that concerning in-use requirements, thrusting contractual obligations on a party by a regulatory process might exceed the mandate of the EPA. Another manufacturer related to the bus industry (2.2.3) recommended that the wording of Section 6.6, In-use compliance, should be changed to account for the fact that certification of mass-produced vehicles was based on statistics and it was possible for an isolated vehicle to rise slightly above the standard. The commenter also noted that Section 205.108-1, Warranty, should define what is required in the case of a vehicle which rises above the standard as a result of the certification based on statistical control and the warranty should only apply to non-compliance resulting from production defects in relation to certified vehicles.

Response:

Because only a small percentage of production vehicles will be tested, manufacturers must take other steps to assure that all vehicles meet the standard at the time of sale, in order to minimize the possible warranty claims. If a claim is made under the warranty, the claimant should be able to point to a defect in design, materials or workmanship that existed at the time of sale. Such claims would have to be made and proven before an action would be successful against a manufacturer.

EPA requires that all vehicles meet the regulation at the point of sale. The manufacturer must design his products so that an adequate margin of safety exists to assure that they all comply.

Statistical sampling is used only in the Selective Enforcement Audit in which a 10 percent Acceptance Quality Level is used. In this situation, if a statistical sample demonstrates with a high degree of confidence, as defined in the SEA procedure, that 10 percent of the vehicles are failing the standard, the Agency may take additional steps to correct the manufacturer's problem. However, all vehicles must meet the standard and none may knowingly be distributed when not in compliance.

The warranty section is being reserved as a result of a recent U.S. Court of Appeals decision, Chrysler Corporation vs. EPA, 600 F.2d 904 (D.C. Cir. 1979). In response to that decision the specific wording for the two bus warranty provisions, §205.108-1(a) and (b), has been reserved. The Agency still requires manufacturers to submit their proposed warranty provisions to EPA.

EPA is preparing a new warranty provision, to be proposed in the Federal Register, which will be consistent with the Chrysler decision. Comments on the notice will be solicited and studied before a final warranty provision is published.

8.8. Selective Enforcement Auditing (SEA), Recall, Cease Distribution

Issue: Is SEA necessary?

Comments:

One bus manufacturer (2.1.12) stated that SEA sampling was unnecessary since the manufacturer must certify 100 percent of his production. The manufacturer went on to add that definitions and rules regarding SEA should be made simpler, more direct and less redundant and that SEA was duplicative and was unnecessary over-regulation. The manufacturer also stated that recall provisions might be the source of arbitrary and unreasonable enforcement requirements by the Administrator without proper procedural safeguards, that the testing by the Administrator had the apparent potential for abuse, and that the cost of transportation to an undesignated site was burdensome to manufacturers. A second manufacturer (2.1.8) stated that the Noise Control Act did not authorize the Administrator to order bus manufacturers to recall non-complying products, nor did it authorize the Administrator to issue "cease-to-distribute" orders to a manufacturer for procedural violations of the regulation which had no effect on the public health/welfare. The manufacturer also stated that many of the administrative and enforcement provisions of the proposed regulations were unconstitutional and statutorily deficient and should be amended or, in certain cases, deleted. The commenter stated that exemption provisions failed to comply with the Noise Control Act of 1972 and violated due process guarantees, and the inspection and monitoring provision was invalid because it violated Fourth Amendment guarantees and exceeded the authority delegated to EPA in the Act. The manufacturer commented that the provision authorizing EPA to test a manufacturer's products violated due process rights and exceeded the statutory authority delegated to

EPA in the Act, and the Selective Enforcement Auditing provision did not include reasonable limitations on its enforcement.

A third bus manufacturer (2.1.13) stated that the provision in Section 205.105-2(f) which authorized EPA enforcement officers to conduct tests at their discretion should be deleted. The manufacturer further commented that there was no question that EPA should retain the authority to observe all tests, but in the interest of preserving lines of responsibility and avoiding potential union or labor conflicts, the manufacturers should remain responsible for conducting the actual tests. The manufacturer also stated that Section 205.106(a) should be deleted in its entirety as an unreasonable burden, wholly outside the authority of the Agency. The manufacturer stated that it was unchallenged that the Agency should be granted access to a manufacturer's test facility in order to adequately monitor noise testing, however, the section went far beyond such safeguards and required that a manufacturer may be ordered at considerable expense to deliver any quantity of vehicles, anywhere the Administrator of the EPA might choose to direct. Aside from the fundamental legal question of the Agency's authority, the manufacturer stated that there were other entanglements especially as they related to school buses. In many cases, school bus body manufacturers did not own the chassis on which they installed the body; the title may remain with the chassis builder or may have been transferred to the purchasing school district in a separate transaction. There would be significant legal questions involved in delivering such a bus to some unnamed location without the express written consent of the owner. At the very least, such an owner could be expected to object to the additional mileage that would be placed on the vehicle. The manufacturer stated that time was also a factor. Frequently sales of school buses were under contracts specifying exact dates and providing monetary penalties for non-performance. The time necessary to deliver the buses to the EPA, conduct the tests and then provide for their return might well make compliance with such contract provisions impossible. The manufacturer commented that, in addition, Subsection (a)(2) provided that the Administrator might test the bus with equipment that "exceeds the performance specifications of the instrumentation and equipment specified by the Administrator in these regulations". According to the manufacturer, this led to the very real possibility that a bus that complied in every respect with the regulations when tested as prescribed, would fail when tested with some instrument of undisclosed extra sensitivity. This rendered meaningless all reliance on published regulations and posed serious warranty questions.

A fourth bus manufacturer (2.1.10) questioned those areas which were under litigation, i.e., warrantless searches of manufacturers' facilities; vicarious liability for actions of independent, subsequent manufacturers who completed construction of incomplete vehicles; recall provisions; and cease-to-distribute orders. An association (2.3.3) commented that the enforcement provisions which allowed EPA to make warrantless entries and searches, issue cease-to-distribute orders, and order vehicle manufacturers vicariously liable for manufacturing changes to the vehicle after it left his control were all invalid and may not lawfully be adopted. Another bus manufacturer (2.1.4) stated that the proposed regulations contained many of the same objectionable administrative and enforcement provisions as the truck regulations and strongly objected to EPA's assumption of such broad authority as entry to a manufacturer's facilities for sweeping, warrantless searches of manufacturing, assembly, development, testing, and administrative operations.

Response:

SEA is intended to serve as an "oversight" tool to require manufacturers to test a certain category or configuration of vehicles if EPA wishes to verify that a manufacturer is producing complying products. The authority for SEA (Sections 6 and 13 of the Noise Control Act) requires the Agency to be reasonable in its requests for SEA's or other testing. Normally, SEA's are issued when there is some question whether a particular vehicle type is in compliance. The Agency may, at times, issue a SEA at random to spot check a manufacturer. Again, the Agency is bound by the reasonableness constraint in its selection and number of SEA's. In Atlas Copco, Inc. et al. v. EPA, No. 76-1354 (U.S. Court of Appeals, D.C. Circuit, April 9, 1979), the U.S. Court of Appeals upheld the validity of the Selective Enforcement Auditing provisions.

EPA requires that all vehicles meet the regulation at the point of sale. The manufacturer must design his products so that an adequate margin of safety exists to assure that they all comply.

Statistical sampling is used only in the Selective Enforcement Audit in which a 10 percent Acceptance Quality level is used. In this situation, if a statistical sample demonstrates with a high degree of confidence, as defined in the SEA procedure, that 10% of the vehicles are failing the standard, the Agency may take additional steps to correct the manufacturer's problem. However, all vehicles must meet the standard and none may knowingly be distributed when not in compliance.

The Agency's authority for the inspection and monitoring section of the regulation stems from the provisions in Section 13 of the Act which provides the Administrator with the authority to have access to information maintained by a manufacturer to enable the Administrator to make a determination as to whether a manufacturer is acting or has acted in compliance with the Act. The authority of EPA personnel is limited to examining records specifically required under the regulation and records of tests conducted on production verification products or products tested pursuant to SEA; inspecting areas where testing is conducted, where vehicles are stored prior to testing, and inspecting those portions of the assembly line where the products are being assembled. EPA has no interest in entry into developmental laboratory areas or areas not concerned with a manufacturer's activities under the Noise Control Act of 1972.

Bus manufacturers will be subject to the general provisions for transportation equipment (Subpart A) as well as Subpart C.

Subpart A has been amended to incorporate changes made to the Agency's inspection and monitoring powers in response to a recent Supreme Court case, Marshall v. Barlow's, Inc. (436 US 307 (1978) and 43 FR 27990 (June 28, 1978)). An EPA enforcement officer may enter a facility only upon the consent of the manufacturer unless the enforcement officer first obtains a warrant authorizing entry. The regulation also provides that it is not a violation of the Act or the regulation if a manufacturer refuses entry to an enforcement officer who does not have a proper warrant.

The Agency has interpreted Section 11(d) of the Act, which provides for the issuance of Administrative orders, as inclusive of the power to issue cease-to-distribute orders and recall orders. Any such orders would be preceded by notice and opportunity for a hearing.

The regulation allows the Administrator to conduct testing in lieu of the manufacturer. The Administrator will be reasonable in exercising this authority. Specific cases when he may elect to conduct this testing are when weather or other conditions prohibit testing at the manufacturer's facility or when the manufacturer's facility does not comply with the regulation. The regulation has been changed (Section 205.106(c)) to require the Administrator to pay all reasonable costs of transporting vehicles to the designated test site in some circumstances.

In regard to objections requiring testing of school buses when the chassis is not owned by the bus assembler, it is possible to work out agreements with chassis owners in order to allow a reasonable amount of mileage accumulation, or brief delays in shipment to customers. Proper planning and the reasonable amount of testing required under the production verification scheme should allow for economical bus testing.

8.9 State and Local Enforcement

Issue: Will it be difficult for State and local agencies to enforce the regulation?

Comments:

A State government official (2.7.3) commented that EPA promulgated regulations and that they were then enforced by someone else, or that no one else wanted to enforce them. He also stated that the lack of seed money made it difficult, if not impossible, to carry out noise control programs in most State and local governments. A second State government official (2.7.7) noted that an enforcement problem of identification of vehicles existed when different vehicles were subject to different limits. A local government official (2.7.11) stated that his city needed money in order to systematically check for compliance with the regulation.

Response:

All buses to which this regulation is applicable will carry labels indicating the date of manufacture, the manufacturer's name, and a statement warning against tampering with the vehicle in a way such that noise emissions may be increased. This compliance labeling requirement will aid State and local officials in identifying the different vehicles and their respective Federal noise standards.

The task of establishing and enforcing State and local in-use standards can be greatly aided by EPA programs which assist State and local authorities in these areas. The EPA programs include limited financial assistance, aid in developing a Model Noise Ordinance, help in establishing Regional Noise Technical Assistance Centers, and coordinating ECHO (Each Community Help Others) programs which enable localities to get assistance from other localities which are already active in handling noise problems.

State and local communities can also obtain financial assistance from the Urban Mass Transportation Administration (UMTA) which offers funds and assistance to develop educational materials, manuals, and training programs for inspectors and repairmen.

8.10 Definitions

Issue: The definitions relating to enforcement need to be clarified.

Comments:

A bus manufacturer (2.1.13) stated that the term "test sequence" was not defined as it was used in Section 205.104-2(e)(3)(iii) or 205.104-1(d)(2)(iii) and that in Section 205.101(a) "bus" should be defined to specify a minimum of passengers. The manufacturer suggested that minimum number be ten, as this was consistent with the Background Document, and with other Federal regulations to which manufacturers were subject. A citizens group (2.5.10) stated that better definitions of "bus" and "vehicle" were necessary.

Response:

Test Sequence is not defined so that a manufacturer is free to determine the proper length of time between calibrations for his purpose. He is allowed to set a schedule which he deems adequate to assure proper calibration throughout his testing.

Because of the comments on the lack of clarity in the proposed regulation regarding who must perform compliance testing, the definitions of "bus" and "vehicle" were changed and two new definitions, "school bus" and "cowl chassis", were added. Briefly, the changes include the following:

- "Vehicle" specifically includes buses and cowl chassis as subgroups covered under the bus standard.
- The "bus" definition now carries the 10,000 pound minimum Gross Vehicle Weight Rating requirement; the proposed definition of "vehicle" originally included this. "Bus" manufacturers must perform interior PV. They must also perform exterior PV if the bus does not incorporates a "cowl chassis".
- "School bus" was defined as a separate subgroup of bus to facilitate their separation from the third step of the standard, scheduled to become effective on September 1, 1987. (See the discussion in the Preamble to the final regulation on the issue of school bus regulation).

SECTION 9

TEST PROCEDURE: COMMENTS AND RESPONSES

9.1 Test Methodology

Issue: Is the test methodology accurate and does it correspond to actual in-use operations?

Comments:

Seven bus manufacturers (2.1.12, 2.1.6, 2.1.13, 2.1.7, 2.1.4, 2.1.11, 2.1.2), two associations (2.3.2, 2.3.1), and one bus user (2.4.4) questioned the test procedure in the proposed regulation, mostly stating that it did not reflect true operating conditions. Three commenters (2.1.2, 2.3.2, 2.1.6) stated that the Society of Automotive Engineers (SAE) test procedure should be used without modification. One commenter (2.1.12) stated that the restrictive test site and methodology requirements of the regulation would put them at a competitive disadvantage. The commenter also questioned the testing of interior and exterior noise levels simultaneously. Another commenter (2.1.4) stated that the proposed regulation did not provide manufacturers with sound, objective test criteria with which to determine compliance.

Response:

The Agency considered using several different existing and proposed noise measurement procedures to evaluate buses, and a modified SAE J366b test was deemed the most appropriate test for buses with standard transmissions or for automatic transmissions which can be normally locked into gear. A modified version was chosen for automatic transmissions which cannot be locked. The procedure, as it now exists, is designed to minimize test variability, yet be flexible enough to not impede testing under reasonable circumstances.

The restrictive test site problem was raised during development of the new truck noise emission regulation when some manufacturers claimed it would be very difficult for them to test. The Agency is aware of a number of commercial test facilities which could perform compliance testing on a fee basis, if the manufacturer did not have his own facility. In addition, it is possible to use airport runways and large parking lots as test sites. The test site and methodology requirements are retained, for the most part, as proposed.

The test procedure provides suitable criteria to determine compliance. The standard is a not-to-exceed standard, with testing to be performed under the EPA test procedure. A bus must comply with the standard when tested on any test site meeting the requirements of the regulation.

In response to the comment warning against testing both interior and exterior levels simultaneously, EPA sees no danger with the simultaneous testing. Testing both levels at the same time would actually reflect noise levels under actual driving conditions in addition to being cost effective.

9.2 Automatic Transmission

Issue: Is the requirement for the lockup of automatic low gear on automatic transmission buses a practical test procedure?

Comments:

Four bus manufacturers (2.1.2, 2.1.6, 2.1.7, 2.1.8), two associations (2.3.2, 2.3.3), and one government agency (2.8.2) questioned whether buses with automatic transmissions that could be locked in gear should be tested with their transmissions locked in first gear. The commenters stated that buses with automatic transmissions should all be tested alike, i.e., without being locked in gear. Two manufacturers (2.1.6, 2.1.7) and one association (2.3.3) commented that low gear lockup was not the normal mode of operation for automatic transmission buses.

Response:

The Agency is primarily interested in the point at which a bus reaches its maximum noise output. The test procedure best suited for obtaining this requires that a single transmission gear be used throughout the test. For this reason, the Agency provides one procedure for automatic transmissions which can be held in gear and manual transmissions, and one procedure for automatic transmissions which cannot be held in gear. These two procedures provide the best test for a given transmission type which will yield the most accurate and repeatable test.

9.3 Clutch Fans

Issue: Is it necessary to require clutch fans to be locked-up during testing?

Comments:

Seven bus manufacturers (2.1.7, 2.1.8, 2.1.10, 2.1.6, 2.1.3, 2.1.2, 2.1.9), one association (2.3.3), two bus users (2.4.3, 2.4.4), one government agency (2.8.2) and three manufacturers related to the bus industry (2.2.1, 2.2.4, 2.2.3) commented that clutch fans should not be required to be locked-up during testing. Four commenters (2.2.4, 2.1.10, 2.1.8, 2.2.1) stated that requiring the fans to be locked-up during noise testing would discourage manufacturers from installing them and would limit their use as noise control and energy saving devices. Three commenters (2.1.7, 2.2.4, 2.1.8) stated that clutch fans should not be required to be locked-up because it was difficult, if not impossible, to lock-up the fans without damaging the thermostatic controls. One commenter (2.2.1) stated that clutch fans only operate five to 15 percent of the time and thus contribute no noise during 85 to 95 percent of the time. Six commenters (2.8.2, 2.3.3, 2.1.8, 2.2.3, 2.1.3, 2.2.1) stated that clutch fans should be off during testing in order to be consistent with the truck noise emission regulation.

Response:

Currently, all of the new transit buses and, in the near future, intercity buses will be equipped with thermostatically controlled fans. Presently, few school buses utilize this type of fan.

Information provided to the Agency indicates that thermostatically controlled fans on transit buses operate between 12 percent and 27 percent of the time, while similar fans on intercity buses operate on an average of 16 percent of the time. If the regulation deletes the testing requirement for thermostatically controlled fans to be engaged during testing, fan noise is expected to raise the typical duty cycle noise level of the bus by more than 1 dB. The higher noise level for transit and intercity buses can be translated into significantly reduced benefits from the regulation. Specifically, if the requirement is deleted, the benefits, measured in terms of single event disruptions of human activities such as interference with speech communication and disturbances with sleep, will be reduced by 30 percent for transit buses and 5 percent for intercity buses.

School bus thermostatically controlled fans are "on" a smaller percentage of the time. Demonstrations show that, on an annual average, school bus fans are operating only about 2.3 percent of the time. The deletion of the fan-on testing requirements for school buses would raise the typical duty cycle noise level of the bus by less than 0.1 dB. This very slight increase in the noise level would reduce the benefits of the regulation only negligibly.

Based upon these studies, EPA has decided to require thermostatically controlled fans on transit and intercity buses to be locked-up (engaged) during testing as required in the proposed regulation. However, school buses equipped with thermostatically controlled fans will not be required to have the fans locked-up during testing because the fans operate only a small percentage of time and thus are not a significant part of total school bus noise. EPA anticipates that the deletion of this requirement for school buses will encourage the use of energy-saving thermostatically controlled fans which result in significant reductions in vehicle noise when compared to vehicles equipped with direct drive fans.

9.4 Engine Brakes

Issue: Should a deceleration test for vehicles equipped with engine brakes be required?

Comments:

Seven commenters (2.4.3, 2.2.2, 2.3.3, 2.1.10, 2.1.2, 2.1.7, 2.1.11) stated that engine brakes should be exempted from the regulations, especially since that requirement was deleted from the truck regulation. One bus user (2.4.3) stated that, on intercity buses, engine brakes are used normally in mountainous, low-population areas and their use increases vehicle safety. One bus manufacturer (2.1.7) commented that the test requirement would discourage their use, which would be hazardous to vehicle operation, particularly for school buses.

Two state government officials (2.7.9, 2.7.12) stated that engine brakes, and particularly "Jake" brakes, are very noisy and that they should be included in the test procedure.

Response:

The proposed testing procedures for buses included a requirement that all buses equipped with engine brakes must be subjected to an extra pass-by test with the engine brake engaged. EPA considered that the additional test burden could induce bus manufacturers to limit the offering of engine brakes on their products, thus reducing the safety and economic benefits (reduced brake wear) attributable to engine brakes. Further, the existing data available to the Agency indicate that the sound levels resulting from vehicle deceleration using engine brakes are not significantly different from vehicle acceleration levels if the vehicle is equipped with proper mufflers. On the basis of these considerations EPA has decided to delete the engine brake test requirement until such time as a health and welfare analysis of the adverse noise impact of engine brakes has been completed. At that time, EPA will consider reproposing the engine brake testing requirement for buses.

9.5 Test Starting Point

Issue: Is there a potential for error in determining the test starting point?

Comments:

A bus manufacturer (2.1.2) stated that the method of determining the test starting point could lead to errors, and an association (2.3.3) commented that the method prescribed by EPA for establishing the compliance test starting point for automatic transmission buses could be in error by one or two times the length of the test vehicles (depending on front or rear reference point) because of reversing the direction of the vehicle after making the transmission shift point. A bus user (2.4.4) suggested that the EPA use a 20 ft. end zone, not 40 ft.

Response:

Section 205.104-1(c) now reads "reference point" where "front" originally appeared. This should remove the confusion which led to the error in the procedure. It also clarifies the testing of vehicles where the reference point may be the rear or at both the front and rear of the vehicle.

The 40 foot test zone has been retained in the procedure. Studies have shown that using a shorter test zone does not significantly improve repeatability. Furthermore, a shorter test zone does make it more difficult to attain the maximum rpm and be positioned within the test zone.

9.6 Load Conditions

Issue: Should the bus be loaded or empty during tests?

Comments:

A manufacturer related to the bus industry (2.2.3) stated that load conditions needed to be defined for exterior noise level measurements. A government agency (2.8.2) and a bus user (2.4.4) recommended that it should be specified that vehicles be empty during testing.

Response:

The regulation specifies that the vehicle must be empty, except for the bus driver and testing technician, during testing.

9.7 Windscreens

Issue: Is the use of a windscreen necessary?

Comments:

A government agency (2.8.2) and a bus manufacturer (2.1.13) stated that the requirement in Section 205.104-2(a)(2) that a windscreen be employed seemed unnecessary since, for the interior measurements, the microphone would be within the bus and protected from the wind.

Response:

The use of a windscreen for any type of noise measuring is good testing technique. The requirement for the use of a windscreen has been retained.

9.8 Microphones

Issue: What is the correct microphone orientation?

Comments:

A bus manufacturer (2.1.7) and a government agency (2.8.2) requested clarification of §205.104-1(b)(2), stating that it was unclear from that section how an engineer or technician would determine the correct orientation of the microphone. A manufacturer related to the bus industry (2.2.5) suggested that the windscreen and microphone should be calibrated to the microphone manufacturer's specifications, in accordance with SAE J1096.

Response:

The section specifying the microphone orientation has been changed to the following:

> §205.104-1(b)(2)...The microphone must be oriented to and fixed in a position that minimizes the deviation from the flattest system response over the frequency range 100 Hz to 10,000 Hz for a vehicle moving from the acceleration point through the test zone.

This change should clarify the exact orientation of the microphone in the bus.

EPA's final rule essentially agrees with the SAE practice regarding microphone usage and windscreens.

9.9 Engine Speed

Issue: Can the definition of rated engine speed be clarified?

Comments:

An association (2.3.3) and two bus manufacturers (2.1.2, 2.1.7) stated that the definition of "maximum rated engine speed" for ungoverned engines was nebulous and subject to different interpretations, and should read: "For ungoverned engines, the maximum engine speed is the speed at which maximum net horsepower is rated by the engine manufacturer according to SAE J-245." The commenters stated that this definition was consistent with SAE noise test procedures and EPA exhaust emission documentation.

Response:

The changes suggested by the commenters have been incorporated, in part, into the final rulemaking, thereby clarifying the definition.

9.10 Testing Requirements

Issue: Should the requirements relating to weather conditions, operation of the heater and air conditioner, and tachometer tolerance be changed?

Comments:

A bus manufacturer (2.1.13) stated that Section 205.104-1(b)(8) of the proposed regulation seemed overly restrictive and might not allow sufficient slope for drainage on the test site. The manufacturer further stated that the requirement for production verification (PV) testing would severely disrupt manufacturing and distribution processes in certain parts of the country; especially during the winter when testing could not be accomplished and therefore shipping would be delayed and additional storage facilities would be required. The manufacturer commented that Section 205.104-1(d)(1) might be overly restrictive, might severely limit the days and hours available for testing, and provided levels that appeared to be unnecessarily low. The manufacturer also stated that Section 205.104-2(c)(2) seemed to require the operation at the same time of both the heater and the air conditioner; a situation that would never occur in normal bus operation. The manufacturer finally commented that the requirement that the entire measurement area be paved would add additional cost to the construction of the test facility, while paving of only the vehicle path should be satisfactory. A manufacturer related to the bus industry (2.2.5) commented that a ± 2 percent allowance for the tachometer was too strict and stated that ± 3 percent was more common.

Response:

Regarding Section 205.104-1(b)(8), this requirement was utilized in the medium and heavy truck regulation and there has been no problem with drainage. The Agency feels that this requirement will not severely impact any manufacturer and thus has left this section unchanged in the regulation.

The Agency realizes that severe weather conditions may prohibit Production Verification (PV) testing. Accordingly, the regulation has been changed to allow manufacturers to distribute in commerce vehicles of a configuration for up to 90 days if weather or other conditions make it impossible to test.

The requirements set forth in Section 205.104-1(d) are according to accepted American National Standards Institute (ANSI) operational standards and have been retained in the final regulation.

Section 205.104-2(c)(2) has been changed so as to not imply that the heater and air conditioner be operated at the same time during testing. It is sufficient for either to be in operation, whichever is noisier.

The Agency will continue to require that the entire measurement area and vehicle path be paved. This is necessary to assure a repeatable noise measurement.

The two percent tachometer tolerance of the meter reading is determined to be necessary to properly observe maximum engine rpm.

9.11 Typographical Errors

Issue: The following typographical errors were identified.

Comments:

Two bus manufacturers (2.1.7, 2.1.13) stated that in §205.104-1(a)(5) "+ 10 percent" should apparently have read "± 10 percent." One of the manufacturers (2.1.13) also commented on Section 205.104-1(a) that in Subsection (a)(3) "± 0.5B" should probably have been "± 0.5 dB". A manufacturer related to the bus industry (2.2.3) commented on Section 205.104-3(a) (iii)(C) that the input signal was defined by frequency and duration, but the level was missing.

Response:

All typographical errors have been corrected.

SECTION 10

ACOUSTICAL ASSURANCE PERIOD (AAP) SOUND LEVEL DEGRADATION FACTOR (SLDF): COMMENTS AND RESPONSES

10.1 Authority

Issue: Does EPA have the authority to require an Acoustical Assurance Period (AAP) and the use of the Sound Level Degradation Factor (SLDF)?

Comments:

Four bus manufacturers (2.1.8, 2.1.10, 2.1.4, 2.1.2), one government agency (2.8.2), one association (2.3.3), and one manufacturer related to the bus industry (2.2.5) stated that the AAP/SLDF provisions of the regulation were unwarranted and beyond the authority provided by the Noise Control Act. One manufacturer (2.1.8) stated that the AAP was an unauthorized in-use standard. A second manufacturer (2.1.10) commented that the AAP was unnecessary because the regulation required manufacturers to specify maintenance periods and inspection periods to avoid degradation of noise abatement equipment and prohibited tampering by users. An association (2.3.3) commented that AAP and SLDF amounted to an illegal attempt to exercise power not delegated by Congress and attempted to circumvent Congress' rejection of "useful life" requirements.

Response:

The Agency believes the AAP is consistent with both the language and purposes of the Noise Control Act. EPA's authority to establish noise emission standards for products distributed in commerce appears in subsections (a), (b), and (c) of Section 6 of the Act. Nowhere do those provisions limit the Agency's authority to require that such products be designed, built and equipped to comply for some period beyond the time of sale. This conclusion is supported by the legislative history of the Act, which makes clear that Congress intended to grant authority to require compliance with Section 6 standards for a specified period after sale.

The purpose of Section 6 is to reduce the noise of products distributed in commerce. Obviously, this purpose would be frustrated if the noise levels of regulated products were to degrade significantly in the period immediately following the time of sale, whether as a result of the characteristics of the product or as the result of a particular manufacturer's use of inferior noise-attenuating components.

The requirement that manufacturers develop an SLDF for each configuration and then subtract it from the applicable standard to determine at the time of sale the noise level for each configuration has been removed. This decision is based upon EPA's belief that properly designed and maintained buses will not degrade during the AAP.

Although the manufacturer must still design and market a product which will comply with the noise standard at the end of the AAP, how the manufacturer reaches that goal is a matter of engineering and business judgment. If the manufacturer believes degradation will occur, he can either improve the quality of noise-attenuating equipment so that it will not degrade, or he can design products to a lower noise level to account for anticipated degradation. Our experience on presently regulated products indicates that manufacturers are designing their products to be, on the average, 2 to 3 dB below the specified standards.

EPA will monitor the in-use performance of regulated buses (particularly during the AAP) to assure their compliance with the standard. If EPA finds that buses are not complying with the regulation, it may require, under Section 13(a) of the Act, that certain manufacturers perform reasonable durability tests on new products.

10.2 Support for AAP/SLDF

Issue: Is there support for AAP/SLDF?

Comments:

A State government official (2.7.7) stated that he supported the proposed regulation because it addressed the problem of quiet new products, but that the Acoustical Assurance Period only partially addressed the problem of vehicles remaining quiet in use. A bus user (2.4.2) endorsed AAP and SLDF, but would have liked to see it cover the expected life cycle or a substantial portion of it. A local government official (2.7.4) stated her support for the AAP requirements.

Response:

EPA maintains the view that the AAP provision is required to adequately protect the public's health and welfare.

In determining the length of the AAP, EPA took into account the magnitude and conditions of use of these products and the best maintenance attendant to noise control. If a high quality product is well maintained, significant degradation should not occur over the expected life of the product. However, EPA does not consider it reasonable to hold the manufacturer responsible after the expected time of the first major overhaul.

Beyond this, it should be the owner's responsibility to ensure that the noise level does not increase due to inadequate maintenance.

10.3 Cost and Economic Impacts

Issue: Will AAP/SLDF cause additional cost and economic impacts?

Comments:

One bus manufacturer (2.1.10) stated that AAP/SLDF would add an unreasonable burden to manufacturers and would unnecessarily increase the cost of buses. Another bus manufacturer (2.1.7) questioned EPA's statement that AAP will not add maintenance costs to vehicles covered by the regulation. The manufacturer stated that in order to protect themselves, manufacturers would have to specify more frequent inspection and replacement of noise abatement components so they could be replaced before failure, and the costs to consumers associated with more frequent preventive maintenance would increase disproportionately to the benefits received. Both manufacturers commented that the wide margin of design safety required by the SLDF and production variation (estimated at 5 dB) would increase the cost of buses considerably more than was stated in the EPA economic analysis. Both manufacturers also commented that the 83 dB and 80 dB levels would be technologically feasible if the AAP requirement was deleted, but that the levels should be increased by at least 2 dB if the AAP was retained.

Response:

It is assumed that one of the primary goals of most manufacturers is to design and build a high quality product. The AAP merely ensures that these same goals are applied to the quieting features of the product.

Consequently, the AAP is not expected to create additional costs for the consumer. The AAP should benefit the consumer by providing an additional incentive for manufacturers to provide high quality, durable, quieted products.

The SLDF requirement has been removed from this regulation.

10.4 AAP/SLDF Criteria

Issue: Could additional time be given to the manufacturers to run tests to determine the SLDF and AAP?

Comments:

Eight manufacturers (2.1.7, 2.1.13, 2.1.2, 2.1.12, 2.1.4, 2.1.6, 2.1.9, 2.1.10, 2.2.5) and two associations (2.3.2, 2.3.1) stated that SLDF will be difficult to determine accurately in the beginning and should either be deleted or delayed a sufficient amount of time so that it could be based on actual measured data. One association (2.3.2) commented that the AAP and SLDF would be very difficult to meet due to varying transit maintenance practices, and the extreme rigors characteristic of transit service, which ranged from ideal to extremely demanding on equipment performance. A bus manufacturer (2.1.8) stated that there was no reasonable way to allocate responsibility between the manufacturer and the user for degradation. Another manufacturer (2.1.6) commented that the manufacturer could not be required to assume responsibility for future performance of the vehicle when they could not control the level of maintenance; it would place the burden of proof of negligence on the manufacturer which would stifle introduction of any new products on transit coaches.

Response:

The SLDF requirement has been removed from this regulation. The AAP is based, in part, on warranties bus manufacturers presently give to purchasers.

10.5 Warranty Periods

Issue: Should the AAP and vehicle warranties be the same?

Comments:

One bus manufacturer (2.1.12) stated that an AAP of two years or 200,000 miles exceeded all current warranty periods and in many instances it was difficult to determine whether deterioration was due to faulty parts or poor maintenance. A bus association (2.3.1) also commented that AAP exceeds the normal vehicle warranty period, and suggested that AAP should correspond to the same period as the warranty. The association stated that this would ensure adequate time for measuring noise increases as well as easing the difficulty of determining SLDF.

Response:

The Acoustical Assurance Period (AAP) is for 2 years or 200,000 miles, whichever occurs first. The AAP compares to the warranty presently specified for Advanced Design Buses by the Urban Mass Transportation Administration.

The AAP is not identical to a typical vehicle's warranty for a number of reasons. First, the AAP is a guarantee from the manufacturer to the Federal government that the product will meet the noise emission standards for an extended period of time when properly used and maintained. Secondly, the AAP is based on a number of factors, one important consideration is the first major overhaul of the vehicle when many of the noise producing components are changed and the manufacturer can no longer be held liable for the components replaced. The SLDF is no longer a consideration.

10.6 Health and Welfare Benefits

Issue: Have the benefits of AAP been analyzed?

Comments:

A bus manufacturer (2.1.7) stated that the AAP was an arbitrary and unrealistic approach to bus noise emissions. The manufacturer also stated that the AAP was so vague and ambiguous that it would permit EPA to saddle the manufacturers with nearly unlimited responsibility for compliance, and the possibility of abuse of this broad-ranging rule and the potential mischief it might cause, far exceeded any marginal benefits attainable as a result of AAP. A government agency (2.8.2) commented that EPA should have determined SLDF and applied it to the health/welfare analysis, and then established not-to-exceed, time of sale standards.

Response:

EPA maintains the view that the AAP provision is required to adequately protect the public's health and welfare. Without this provision, the benefits of the regulation could be severely reduced. If the noise control features of a product are not designed to be durable over time and the noise characteristics of regulated products degrade significantly after the sale of the product, no substantial health and welfare benefits can result from the regulation.

10.7 AAP - Technological and Economic Impact

Issue: Were the technological and economic impacts of AAP considered?

Comments:

A government agency (2.8.2) commented that no consideration was given to the design or cost impact of in-use standards, and therefore that in-use standards should be deleted. A bus manufacturer (2.1.8) stated that the Background Document did not consider the technology or economics of AAP and SLDF, as required by the Noise Control Act.

Response:

The applied noise abatement components, which when properly used and maintained, should not degrade, at least not by any appreciable amount. Considering that one of the primary goals of most manufacturers is to build high quality products, and that a minimal amount of maintenance is required during the early years of buses, the expected costs of installing new technology and maintaining the noise standard technology are low. Studies conducted by the EPA have found that given an appropriate level of maintenance and preparation, overall bus noise levels are not expected to degrade over a period of two years or 200,000 miles, whichever occurs first.

SECTION 11

TRANBUS:
COMMENTS AND RESPONSES

11.1 Transbus Specifications

Issue: Did EPA coordinate the bus noise regulations with the Transbus specifications?

Comments:

An industry association (2.3.2) stated that many of the statements in the Background Document (August, 1977) were incorrect and misleading, especially since they were prepared without any regard to the requirements of the DOT action of May, 1977, directing that Transbus be mandated by September, 1979. The association commented that it was irresponsible to have another Federal Agency promulgate a rule which would cast aside the months and years of study and design effort in the Transbus program. The association supported the 80 dB level as long as it was the same as the DOT Transbus, i.e., measured with a plus or minus variation, and not as a "not-to-exceed" standard, because the plus or minus level could be met at reasonable cost, with definite benefits to passengers and the public. The association further commented that although it might be possible to meet the 80 dB and 77 dB levels, the steps necessary to accomplish them were counterproductive to UMTA's goals of an easily-maintained bus with low operating costs and higher reliability. The association commented that the additions and changes to bus design necessary to meet the proposed levels would impede normal maintenance operations, take more time, and some might not be done at all because of accessibility problems. A second industry association (2.3.3) questioned the consideration given to the impact of low floor Transbus design mandated by DOT for UMTA-funded transit buses after September 1979.

A transit bus manufacturer (2.1.8) recommended that transit coaches be regulated to 80 dB as required by the current U.S. DOT Transbus specification. The manufacturer stated that this recommendation was consonant with UMTA's wishes and was a level arrived at after years of consideration. It was further commented that promulgation of proposed regulations for transit buses should be delayed until the DOT Transbus had been designed, tested and put into service, because Transbus would require major departures from current designs, which were not taken into account in EPA's technical and economic analyses and especially, because of lower floor and loss of seating capacity. Another transit bus manufacturer (2.1.6) remarked that the proposed standards were the same as UMTA's Advanced Design Bus, but that UMTA allowed a ± 2 dB variation for manufacturing tolerances. The manufacturer further stated that there was no way to meet maintainability and accessibility requirements of Advanced Design Bus and Transbus specifications, and EPA's 80 dB and 77 dB noise levels. A Federal department (2.8.2) proposed that transit buses should be excluded from the proposed regulation in deference to UMTA Transbus.

Response:

EPA conducted preliminary technology assessments of the original Transbus program based on information obtained from the Urban Mass Transportation Administration (UMTA) program office. We later learned that UMTA did not receive a single bid from the U.S. bus industry, within the prescribed time period, to the first solicitation from the consortium of prospective Transbus purchasers. In response to this lack of industry interest, UMTA has temporarily suspended the Transbus specifications and has initiated a review of the Transbus program. Since the Transbus has never been commercially produced and in the absence of detailed specifications, EPA is unable to coordinate the noise regulations with the UMTA specifications.

11.2 Economic Impact of Transbus

Issue: Is the impact of the Transbus specification included in the economic impact assessment?

Comments:

An industry association (2.3.2) maintained that the costs outlined by EPA for meeting the 80 to 75 dB levels were either totally inappropriate (and were not provided by the manufacturers for this purpose) or they would be higher because EPA did not account for low-floor Transbus loss of seats and higher operating and maintenance costs resulting from the proposed regulation. A transit bus manufacturer (2.1.8) stated that EPA did not consider DOT Transbus specifications, which would substantially influence the economic assessment.

Response:

The cost and economic impact of the regulation on the Transbus program has not been assessed.

SECTION 12

TRANSIT MALLS: COMMENTS AND RESPONSES

12.1 Transit Malls

Issue: Will the bus regulation have adverse impact on the use of transit malls?

Comments:

One local official (2.7.8), a Portland noise control officer, submitted the following comments: His city, like other cities, had a conflict between the need for mass transit and the need for housing, and without Federal standards which were realistic and protective, they could not reconcile these competing needs. Old housing units downtown might not be able to get Federal (HUD) or private monies for rehabilitation because of bus noise levels. In order to qualify for HUD funding, his city was required to maintain a bus fleet which met an L_{eq} (12 hour) of 67 dB for transit malls, and of less than or equal to 72 dB for individual buses. Appropriate and rigorous bus noise regulations were critical to the survival of the city because of their implications for revitalization of downtown areas, continued livability of neighborhoods, and growth of mass transit. The official further maintained that the proposed regulations did not fully address the transit situation, specifically the failure to consider transit malls. He suggested that an additional Background Document should be prepared dealing with transit malls and buses and recommended that this document be available within one year. He further stated that Portland had already borne economic costs/losses because of bus noise, specifically through the loss of housing units. A second local official (2.7.5) expressed support for the standard L_{eq} (12)

of 67 dB (ambient level for transit malls) because it provided maximum protection to the public that could be achieved with current technology at reasonable cost and the level was consistent with HUD standards and eliminated speech interference. The official further supported the 72 dB bus noise level (not-to-exceed) which would comply with HUD standards. He urged that EPA not adopt final standards for transit buses until it had considered transit malls, the 72 dB bus, and compatibility with HUD standards.

In comments to the Agency, the Mayor of Portland (2.7.10) noted the lack of coordinated and uniform noise standards and enforcement programs. The Mayor stated that the EPA proposed standards for 1985 exceeded standards for HUD-funded projects, and this made effective planning and enforcement difficult. The Mayor further remarked that the proposed standards perpetuated and encouraged low-density development and suburbanization because such high external noise levels meant regular bus services might be prevented from serving HUD-financed projects; and EPA failed to consider the impact of the proposed regulation on concentrated areas, e.g., bus malls, which indicated a lack of coherent Federal policy. The Mayor contended that there was an increasing trend for high-density residential development, including bus malls, and preferential bus and transit corridors, and these proposed regulations ignored the realities of urban life and necessities for urban survival. In a submission to the docket, Portland's transit authority (2.4.4) commented that the exterior standard of 77 dB was not acceptable for heavy urban bus traffic because it failed to recognize the role of mass transit in the community and the impact when transit captured a large percentage of the traffic in the central business district, with or without transit malls. Their concern was not specifically limited to the transit mall, but was also directed toward the general trend in the direction of increased concentrations of transit buses. They also suggested that bus yards were a noise problem to be considered.

Response:

Portland, Oregon has a somewhat unique situation in that part of the downtown area has an auto-restricted zone. This has greatly increased the bus noise in the last few years. So that HUD funding will not be denied, EPA has jointly funded a research grant with UMTA to retrofit several Portland transit buses. If these tests prove successful, further grants may be provided to retrofit Portland's entire fleet.

Also as a result of this retrofit program a report will be developed jointly by UMTA, EPA and Portland.

At this time, the most stringent noise emission standards for transit buses will be a "not-to-exceed" level of 77 dB. The technical feasibility of a 72 dB standard is still under evaluation. The Agency has underway a "quiet truck" demonstration program which is assessing the technical feasibility of reducing exterior noise levels below 75 dB. Based in part, on the results of this program, the Agency may propose a third level of stringency for the existing medium and heavy truck noise regulation. Consideration will then be given to the need for more stringent noise emission levels for buses.

SECTION 13

GENERAL:
COMMENTS AND RESPONSES

13.1 Lead Time

Issue: Should there be more lead time to meet the various levels of the regulation?

Comments:

One school bus manufacturer (2.1.10) stated that to meet the 83 dB level, a minimum of 20 months would be required to develop and produce the noise abatement hardware for a line of vehicles. Another school bus manufacturer (2.1.7) suggested the 77 dB level should be delayed until experience had been gained from 83 and 80 dB standards. They further stated that there should be at least four years between the 80 dB standard and the next drop in regulated sound levels, otherwise manufacturers would have the onerous task of designing to two standards at the same time. A third school bus manufacturer (2.1.13) commented that the body style, accessories and interior finish affected engine and exhaust noise. Since one could not work with these until one had the chassis, and the compliance dates were the same for interior and exterior, body manufacturers would not have sufficient time to perform interior modifications, if required. The manufacturer stated that interior regulatory levels should be one year behind the exterior levels for vehicles manufactured in two stages.

Response:

The effective dates of the regulation have been extended two years to compensate for the Agency's delay in issuing the final rule. The dates have been selected to allow all manufacturers ample time to tool up and apply noise control technology appropriate to the noise standards without significant disruption to the industry. Further, the effective dates have been adjusted to coincide with the manufacturers' model year.

The lead times for the interior regulatory levels will remain the same as the lead times for the exterior levels. The Agency does not believe that there will be a need to effect significant modifications to the interior of the bus, since the modifications appropriate for exterior noise reduction should bring the interior levels down to the requisite level.

13.2 Regulatory Sound Level Selection

Issue: Should there be changes or revisions to the regulatory levels?

Comments:

A local noise official (2.7.5) recommended that EPA consider levels below the 75 dB level, possibly down to 72 dB which was the limit of the state-of-the-art technology. He stated that lowering bus noise below that which was proposed would make transit bus travel more amenable, and thus would give public transit a boost. This, in turn, would give air quality a boost. A bus trade association (2.3.2) commented that the 78 dB Low Noise Emission Product procurement standards were reasonable and could be accomplished, but the 75 and 72 dB procurement standards were too stringent and could not be met practically. They further recommended that EPA not promulgate the 77 dB noise emission standards, but instead, conduct studies and tests in conjunction with the association and bus manufacturers concerning costs and difficulties versus passenger and public benefits derived from 83 and 80 dB levels. A Federal department (2.8.2) recommended that the proposed 77 dB level be dropped because of insufficient supporting technical and health and welfare data. One transit bus manufacturer (2.1.6) suggested the proposed levels for 80 and 77 dB be delayed for 18 months, during which time an extensive, cooperative test program should be undertaken to determine the feasibility of those levels. Another transit bus manufacturer (2.1.8) commented that buses should be considered a subset of trucks, and thus, be regulated to the same levels, i.e., no lower than 80 dB starting in 1982. A local noise official (2.7.8) recommended that an additional Background Document be prepared addressing the advantages and disadvantages of regulatory levels between 75 and 65 dB and that document be made available to the public within one year. A United States Congressman (2.8.1) recommended that noise levels should be lowered to 71 dB by 1983. A bus user (2.4.4) proposed the following standards: exterior standard of 71 dB and interior standard of 67 dB in 1983. According to a city supervisor (2.7.11) it was a good idea to have two standards--one for idling and one for moving buses. An intercity bus user (2.4.3) recommended that for intercity buses, 83/86 dB standards should apply through 1985. A school bus manufacturer (2.1.10) stated that since truck data was used as a basis for setting levels for buses, and EPA could not justify truck levels below 80 dB without new data, EPA could not be more stringent on buses. Thus, this manufacturer recommended that the level of 77 dB be deleted. An intercity bus manufacturer (2.1.12) commented that any standard which imposed a lower external standard than an internal standard evidenced an elementary misunderstanding of intercity bus operations.

Response:

The regulatory levels which the Agency proposed were derived only after conducting extensive studies of the three major bus classifications: transit, intercity, and school buses. The levels were determined based on the availability of current technology, such as turbocharging, partial or complete engine enclosures, muffler modifications, and other noise abatement techniques which can be installed, taking attendant costs and health and welfare benefits into account. Based on these considerations, the Agency considers that the regulatory levels are appropriate, at this time. However, as technological advances occur, lower levels may be achieved. EPA will consider all new information and data which become available or are presented to the Agency and may subsequently revise this regulation.

The purpose of the Low Noise Emission Product (LNEP) program is to stimulate industry to "press technology" beyond that considered best available today. The bus LNEP noise level has therefore been designated as 5 dB below the level achievable through the application of "today's" best available technology; an exterior level of 72 dB and an interior level of 75 dB.

The regulatory levels for school buses have been harmonized with the Federal noise emission standards for trucks, since the school bus cowl chassis is basically a medium truck without a cab. Two standards, one for idling and one for moving buses, have not been proposed because of the economic burden it would place on industry.

The interior bus noise level is designated higher than the attendant exterior level because the measurement procedure for the interior standard requires the microphone be placed at the seat location closest to the engine compartment compared to the exterior measurement procedure which requires the microphone to be placed 50 feet from the centerline of the bus path of travel. If adjustments are made to the required exterior level to account for special differences between the two measurements, the exterior level will be in excess of the interior level.

13.3 Classification

Issue: What types of vehicles should be included in the regulation and what should be the provisions for regulatory treatment of different types of vehicles?

Comments:

An industry trade association (2.3.3) stated that the proposed regulation failed to adequately consider the differences among school, intercity and transit buses. A second industry trade association (2.3.1) noted that the proposed regulations were more applicable to school and transit buses than intercity buses because operational functions of school and transit buses are different, i.e., they operated within urban and suburban areas, whereas intercity buses operated on expressways and interstate highways with a minimum of operation in noisy low-gear and shifting modes. A local noise official (2.7.8) stated that it was more appropriate to differentiate among buses by use and impact, and to provide different regulatory schedules according to each use. A state government noise control official (2.7.9) suggested that EPA include retrofit requirements in the regulation while another state official (2.7.5) proposed that EPA develop a separate regulation for urban transit buses. A bus user (2.4.2) suggested that upcoming paratransit vehicles in the 6,000 - 10,000 lb. GVWR class should not be ignored. They further commented that if EPA stayed at the 77 dB level, then the Agency should just regulate vehicles greater than or equal to 10,000 lbs. GVWR, so that his State could issue more stringent regulations for vehicles below the Federal regulatory weight. A Federal department (2.8.2) requested clarification of whether motor homes were included in this regulation and stated that they should be part of either the existing medium and heavy truck noise regulation or proposed bus regulation. A citizens group (2.5.10) recommended that forward-mounted diesel engines be covered by the regulation and that they should meet the same levels as gasoline engines. A school bus manufacturer (2.1.13) stated that one segment of the bus population was omitted (Page 3-21, Background Document)--adult or special purposes buses, and that these should be accorded special status or be grouped with school buses for the purposes of analysis and regulation.

Response:

Each bus type was examined separately in terms of the technology needed to reduce the noise source, the attendant health and welfare benefits and the cost and economic impact. In the health and welfare analyses, consideration was given to where different types of buses operated and their respective modes of operation. For example, school buses do not, for the most part, operate on interstate highways. The health and welfare analyses took that fact into consideration.

With respect to requiring retrofit of existing buses, the Agency has no authority under the Noise Control Act to impose such requirements. Its authority is limited to regulating newly manufactured vehicles; however, State and local governments may impose retrofit requirements if they wish.

The bus weight rating specifications were selected to be consistent with existing noise regulations for medium and heavy trucks. Buses with GVWR of less than 10,000 lbs. are similar to automobiles, small trucks and other similar light vehicles and, therefore, are not included in the bus noise emission regulation. Any other State or locality may regulate buses of less than 10,000 lbs. GVWR to the noise level that they deem appropriate for their respective jurisdictions. If at some later date a Federal regulation for buses under 10,000 lbs. GVWR is promulgated, then, at that time, State and local regulations not identical to the Federal rule will be preempted.

The proposed regulation did not exclude forward-mounted diesel-engined buses from compliance with the regulation. The final rule also requires special purpose buses, such as those used at airports, hotels, amusement parks or prisons, to comply with the regulation if they have a Gross Vehicle Weight Rating (GVWR) in excess of 10,000 pounds. Buses are defined as "an engine-powered vehicle with an enclosed passenger compartment designed for the transportation of passengers on a street or highway and having a Gross Vehicle Weight Rating (GVWR) in excess of 10,000 lbs". Any vehicle meeting this definition must comply with the regulation.

13.4 Uniformity of Treatment

Issue: Is there need for regulation on the national level?

Comments:

A local government official (2.7.8) noted that noise reductions would not occur in the market place without Federal regulation. A bus user (2.4.4) commented that bus noise could be effectively dealt with only on the national level with manufacturing standards.

A bus manufacturer (2.1.13) stated that even if one or more classes of buses could be shown to be major noise sources, there was nothing supporting "national uniformity of treatment as essential to control". A local government agency (2.7.14) commented that they did not support the regulation because it was not appropriate for many small, rural areas and that it should be a local option, not a Federal mandate.

Response:

The Noise Control Act of 1972 states "that, while primary responsibility for control of noise rests with State and local governments, Federal action is essential to deal with major noise sources in commerce, control of which requires national uniformity of treatment". Because of the preemptive nature of the Act, this regulation will protect bus manufacturers from having to meet varying, and possibly conflicting, State and local standards.

13.5 Public Comments

Issue: Were there expressions of support or opposition to the regulation?

Comments:

A local government official (2.7.4) noted that she had received hundreds of complaints concerning bus noise, including turn-signal noise, and noise from idling buses of all three types. She stated that the major source of complaints concerned tour buses in residential areas, and that urban dwellers very much desired strong noise limits. A private citizen (2.5.20) commented that noisy buses should be fixed to improve environmental quality and that buses were more annoying than motorcycles because there were more of them. A State government official (2.7.7) commented that buses on the average were noisier than motorcycles. Two police officers (2.7.1) noted that they received many complaints on brake, turn signal, and tire noise as well as on idling buses and buses accelerating on narrow residential streets.

A second private citizen (2.5.12) commented that transit buses were the major cause of noise. A citizens association (2.5.4) noted that they had received many complaints about excessive vehicle noise and bus noise. The association stated that speeding buses caused 85 to 90 percent of the noise, especially during peak periods; that buses posed a safety hazard for children, pets and senior citizens; and that bus noise came from acceleration on hills, and speeding and braking on level ground. Another local government official (2.7.11) stated that residents in suburban areas complained about tour buses. A bus user (2.4.2) commented that transportation noise was the number one irritant in the community. A third private citizen (2.5.22) commented that noise from large diesel coaches was ear shattering, and intruded on the quietness of his apartment.

A bus user (2.4.3) commented that intercity buses were not major sources of noise and that they had not received any complaints from passengers or residents on excessive noise. The bus user stated that only 5 percent of operating time for intercity buses was in congested areas and the normal operating mode on highways was not accelerating or decelerating and thus the noise level was substantially below standard. A bus manufacturer (2.1.12) stated that the intercity bus industry had received virtually no complaints about its buses' noise, and to effectuate a burdensome solution as proposed, where no problem existed, was not in the public interest. A private citizen (2.5.5) commented that no one suffered from bus noise and the proposed regulation was a waste of taxpayers' money. Three private citizens (2.5.9, 2.5.18, 2.5.13) stated that motorcycle noise was more offensive than bus noise, and it should be regulated.

A member of the biomedical community (2.6.9) recommended stronger standards in order to reduce noise interference by 80 to 90 percent. A private citizen (2.5.19) stated that diesel transit buses were very loud and irritating while the recipient of the noise was on the street or in the house, and that noise represented a proven long term threat to public health and stability. He further commented that noise levels must be reduced to a healthy and socially acceptable level. A second member of the biomedical community (2.6.4) stated that noise was a stressor in life which contributed significantly to a decrease in the quality of life, and that anything that was done to lower noise levels would be of rather wide-ranging benefit. He stated that the bus regulation was a significant step to cover one area of a larger problem, and all areas must be tightly covered in order to be effective. A state government official (2.7.5) stated that bus noise should be reduced, that the key was strong national standards for manufacturers, and that EPA's proposed standards could and should be more stringent. A bus user (2.4.4) stated that if EPA's bus regulation was not a meaningful one, they would most likely set up their own shop, invent their own quiet bus and retrofit their fleet, which was not the most effective way of doing it. A second bus user (2.4.2) stated that the proposed Federal standards were substantially more lenient than California's established standards but that if future transit traffic had to be limited to control noise, it would cripple the industry's ability to meet growing community transit needs--which would be the beginning of the end for mass transit. An association (2.3.2) commented that they supported reduced interior and exterior noise levels to the maximum extent possible in keeping with safe, reliable, economic operations and attractive service. A local government official (2.7.11) expressed support for the proposed regulation, stated it was important to have both interior and exterior regulations, and commented that in spite of local and California standards, more regulations were needed, particularly for public transit. A state government official (2.7.3) commented that all in all, the proposed document was a fair-handed estimate of what could be done to provide a quieter environment without severely impacting the manufacturing segment of our society and their department was strongly in favor of the adoption of the regulations. A local government official (2.7.4) stated that they very strongly supported the proposed noise emission limits, and that the limit of 83 dB would decrease the noise impact of buses from an equivalent of 70 passenger cars to 23, and that the limit of 80 dB would reduce bus noise to the equivalent of 11 1/2 autos per bus, which was very important to encourage transit use. Thirteen commenters (2.7.6, 2.7.13, 2.7.9, 2.6.2, 2.6.3, 2.5.4, 2.5.7, 2.6.10, 2.5.12, 2.6.5, 2.6.1, 2.6.7, 2.5.7) stated that they supported the proposed regulation. Five commenters (2.5.6, 2.7.2, 2.5.1, 2.5.3, 2.5.15) stated that they supported the regulation and that EPA should also regulate other noise sources including motorcycles, trucks, snowmobiles, and other motor vehicles.

Another local government official (2.7.8) commented that the regulations should only apply to school and intercity buses, because adequate consideration was not given to transit mall situations. A bus manufacturer (2.1.12) stated that they supported the proposed regulation with some reservations. One private citizen (2.5.2) stated that he favored the setting of voluntary standards to encourage the building of quieter buses. Another private citizen (2.5.16) noted that "riding noises" due to the roughness of the ride, and discomfort due to other riders playing radios, were problems on the buses in his city and that these problems needed resolution.

A local government (2.7.14) commented that they did not support the proposed regulation because exterior bus noise was not objectionable to most people. A bus manufacturer (2.1.4) stated that because of the number of serious deficiencies, they urged the withdrawal of the proposed bus noise regulation. Two bus users (2.4.1, 2.4.5) stated that they were opposed to the proposed regulation. Two private citizens (2.5.5, 2.5.11) commented that they strongly opposed the proposed regulation.

Response:

EPA estimates that approximately 93 million people are exposed to traffic noise levels equal to or greater than a day-night noise level (L_{dn}) of 55 dB, the maximum level the Agency has determined is requisite to protect the public health and welfare with an adequate margin of safety. Buses are an integral component of the urban noise problem. This Federal noise emissions standard for buses will reduce the adverse noise impacts from buses by nearly half.

The regulation will require manufacturers to reduce the noise of the major noise producing components such as the engine, exhaust and cooling fan which should result in reduced acceleration, cruise and idle noise levels. The regulation will not control the noise from brakes, turn signals or tires.

The EPA has also proposed a noise emission regulation for motorcycles. The proposed standards for motorcycles and motorcycle replacement exhaust systems were published March 15, 1978 in the Federal Register (43 FR 10822). Motorcycles, as buses, are considered to be a major contributor to the surface transportation noise problem in the U.S.

Approximately 75 percent of the commenters were in favor of the regulation and 25 percent were opposed.

13.6 General

Issue: Should EPA reconsider the entire regulation?

Comments:

A representative from a public school district (2.4.6) stated that with this proposed regulation, EPA was overstepping the original intent behind the formation of the Agency. An industry trade association questioned EPA's identification of buses as a major noise source and stated that EPA should reconsider the factual and conceptual basis on which it had relied for the proposed regulation. The association also stated that the proposed regulations had tried to encompass too many areas that were undefined and unproven.

One local government official (2.7.4) commented that the mass transit coach was a major cause of urban noise, and that one transit bus approximately equaled 18 passenger cars in "traffic benefit"; thus a maximum 80 dB level must be enforced to obtain a proper balance between noise pollution and traffic benefit.

Response:

The Noise Control Act of 1972 recognized that noise is a nationwide environmental problem. The Act further states that surface transportation noise is one of four areas of major concern where noise impacts can be hazardous to the general health and welfare of the public. To significantly reduce the impact of surface transportation noise on the general public, the noise emissions of all major contributors to overall surface transportation noise need to be reduced. Buses are a principal contributor to the surface transportation noise problem.

13.7 General

Issue: Are specific changes to the regulatory language needed?

Comments:

Two bus manufacturers (2.1.7, 2.1.10) commented that in most instances, EPA had not included in the proposed bus regulations the Proposed Miscellaneous Amendment to the Medium and Heavy Truck Regulation (42 FR 27620), despite the fact that the provisions of the proposed bus regulation obviously paralleled those of the truck regulation and the Proposed Miscellaneous Amendments were as applicable to the proposed bus regulation as they were to the truck regulation. The manufacturers requested modification of the bus regulation to incorporate the Proposed Miscellaneous Amendments.

Response:

The commenters recommend that the amendments to the noise regulation for new medium and heavy trucks, 40 CFR Part 205 Subparts A & B, occurring as a result of the Chrysler et al vs. EPA law suits (reference 42 FR 61457), be incorporated into the final bus regulation. The amendments are, for the most part, incorporated into the final bus regulation with the exception of the change to §205.107-1 (test request).

13.8 General

Issue: Were there expressions of support or nonsupport for other commenters' testimony?

Comments:

A government official (2.8.3) requested that all possible consideration be given to the recommendations made by Mr. McCarthy of Tri-Met in his testimony at the public hearings in San Francisco on November 1, 1977. A bus user (2.4.2) stated that they did not support the testimony of the American Public Transit Association (APTA). Two bus manufacturers (2.1.2, 2.1.14) stated that they supported the position and testimony of the Motor Vehicle Manufacturer's Association (MVMA).

Response:

EPA has considered all testimony in promulgating the final rule.

Appendix A

LISTING OF ORGANIZATIONS AND INDIVIDUALS CONTACTED IN THE DEVELOPMENT OF THE REGULATION

LISTING OF ORGANIZATIONS AND INDIVIDUALS CONTACTED IN THE DEVELOPMENT OF THE REGULATION

The list below, together with the list in Section 2, details those organizations and individuals with which EPA had contact concerning the development of the noise emission standards for buses. EPA has made a concerted effort throughout the entire development process of the regulation (the identification of buses as a major source of noise, the development of the proposed regulation, the public comment period, and the development of the final regulation) to solicit and encourage contacts with the public. These contacts have provided the opportunity for the public to participate fully in the rulemaking process, and to have their interests and concerns known, and, where appropriate, included in the regulation. The entries on the list are grouped together to show the various sectors of the public with which EPA had contact. The grouping headed MEDIA, includes media organizations with which the Agency was in contact and those which independently carried stories concerning noise from buses.

The contacts with the public have been of several different types: by mail, by telephone, at meetings, through briefings, and through the media. In addition, an important aspect of the Agency's public participation program was the formal 90 day period during which public comment on the regulation (as proposed) was solicited. Comments were gathered during that period through written submissions and by holding two public hearings. Organizations and individuals who commented during this period are listed in Section 2 of this document, and even though many of these had contact with EPA at other times during the development of the regulation, they are not re-identified in this appendix in order to avoid duplication. Therefore, the lists in Section 2 and this appendix, when combined, detail the public that was contacted and that participated in the development of the noise emission standards for buses.

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Local, State, Federal and Foreign Governments and Agencies

San Francisco CA Board of Supervisors

New Jersey Department of Environmental Protection

Illinois Pollution Control Board

Embassy of Spain

Santa Clara County CA Health Department

Oregon Department of Environmental Quality

Chicago Department of Environmental Control

Bureau of Motor Carrier Safety, Department of Transportation

National Highway Traffic Safety Administration, Department of Transportation

Arlington County VA Department of Inspection Services

U. S. Army Environmental Hygiene Agency

New York Legislature

Arlington County VA

U. S. Army Mobility Equipment Research and Development Center

Senator J. Myers

Congressman W. E. Fauntroy

Congressman R. S. Regula

Congressman W. A. Steiger

Congressman J. M. Collins

Senator B. Bayh

Congressman G. L. English

Senator A. Cranston

Senator P. Laxalt

Senator R. S. Schweiker

Associations

Wisconsin School Bus Association

National Association of Motor Bus Owners (now American Bus Association)

National Association for Pupil Transportation

National Association of Counties Research Foundation

National Audubon Society

Society of Automotive Engineers

Institute of Noise Control Engineering

Southeastern States Directors of Pupil Transportation

Industry

H. C. Gabler, Inc.

Fleetwood Enterprises, Inc.

Creative Transportation Systems

Service Engine Company

Spring Mills, Inc.

Automotive Research Associates, Inc.

Surrey, Karasik, and Moore

Baker, Hostetler, Frost and Towers

Dynamic Science, Inc.

Suomen Autoteollisus

FMC Corporation

Aero Space Corporation

Fleet Management

Suzuki Motor Corporation

International Research and Technology Corporation

ORI, Inc.

Long, Davy Associates

Borisoff Engineering Company

School Bus Parts Company

Caterpillar Tractor Company

Minibus, Inc.

Gillig Brothers, Inc.

Wayne Corporation

Cummins Engine Company, Inc.

Urban, Regional and Environmental Planning, Architecture, and Development

Automotive Exhaust Systems Manufacturers Committee

Carpenter Body Works, Inc.

Thomas Built Buses, Inc.

Eaton Corporation

Volvo of America Corporation

Crown Coach Corporation

Flyer Industries, Ltd.

Chance Manufacturing Co., Inc.

Housman Bus Sales

Coach and Equipment Sales Corporation

Atlantic Research Corporation

General Motors of Canada, Ltd.

Prevost Car, Inc.

Eagle International, Inc.

Ward Industries, Inc.

Transit Authorities and School Districts

St. Paul MN Metropolitan Transit Commission

New York City Transit Authority

Johnson School Bus Service, Inc.

Long Beach CA Public Transportation Co.

National Transportation Policy Study Committee

Clayton County Board of Education

Lincoln County NV School District

Sumner WA School District

Virginia Department of Education

Drummond WI School District

Hesston KS Board of Education

Wautoma WI Area School District

Nevada Department of Education

Tennessee Department of Education

Texas Education Association

Boston MA Board of Education

Chicago IL Board of Education

Montgomery County MD Public Schools

Maryland Department of Education

Colleges and Universities

California State University

West Virginia University

University College of London

C. W. Post College

Private Citizens

D. Oliver

W. O. Strong

R. & J. Crowley

L. Conti

L. S. Brown

P. E. Coun

P. Goldston

J. E. Naughton

D. Meloy

R. Collier

C. & E. S. Tucker

C. J. Percle

E. V. Wychoff

G. H. Clements

C. L. Roger

E. G. Marquardt

M. Headley

A. Point

I. Kahn

M. E. Pinckney

E. Schwed

J. R. Tonry

P. Harmik

L. E. Burns

W. G. Wells

R. H. Smith

B. A. Weber

H. F. Renneberg

E. J. Reilly

H. Reabe

E. M. Dunbar

H. Williams

E. Backenbach

L. Renoir

G. C. Simpson

H. W. Mortimer

J. W. Eggers

C. G. Eckert

F. R. & A. Salisbury

J. Neblett

Media

Automotive News

Fleet Owner

Passenger Transport

Commercial Car Journal

Buffalo NY News

Government Executive

Milwaukee WI Sentinel

Upper Darby PA News of Delaware County

Beaver PA Beaver County Times

Washington DC Star

Baltimore MD Sun

Brooklyn NY Graphic

Philadelphia PA Chestnut Hill Local

Noise Control Vibration Isolation

Dexter MI Leader

Port Arthur TX News

Commerce Business Daily

Noise News

Sound and Vibration

Noise Regulation Reporter

Automotive Engineering

Buffalo NY West Seneca Observer News and Views

Ontario NY Wayne County Mail

Portland OR Daily Journal of Commerce

Gardena CA Gardena Valley News

San Diego CA Union

Hillsboro OR Argus

St. Petersburg FL Independent

Fortune

Los Angeles CA Times

Mass Transit

Bus and Truck Transport

Philadelphia PA Inquirer

High Speed Ground Transportation Journal

Hillsdale NJ News

New York NY Gramercy Herald

Boston MA Globe

Norwalk CT Hour

Newtown CT Bee

Madras OR Pioneer

New York NY Times

Reading PA Eagle

Philadelphia PA News

New York NY Post

Covington GA News

Murfreesboro TN News Journal

Gloucester City NJ News

Pittsburgh PA Post Gazette

New Hope PA Bucks County Gazette

Levittown PA Bucks County Courier Times

Jackson MS Clarion Ledger News

State College PA Center Daily Times

Minneapolis MN Tribune

Bristol CT Press

Christian Science Monitor

Forbes

Los Angeles CA Los Angeles City Press

Portland OR Oregonian

Seattle WA Times

Tujunga CA Record Ledger

San Gabriel CA Sun

Wall Street Journal

Urban Transport News

San Jose CA News

San Francisco CA San Francisco Progress

Milwaukie OR Review

Phoenix AR Arizona Republic

Tucson AR Citizen

Dallas TX Times Herald

Electric Vehicle News

WAVA Radio

WTOP Radio

WMAL Radio

Chicago IL Daily News

Kansas City MO Times

New Orleans LA Times Picayune

Miami FL Herald

WKJW TV

Nation's School Report

Bakersfield CA Californian

Utica NY Daily Press

Rochester NY Democrat and Chronicle

White Plains NY Reporter Dispatch

Mechanix Illustrated

Business Week

Heavy Duty Trucking

Holyoke MA Daily Transcript

Staten Island NY Advance

Honolulu HI Star Bulletin

San Gabriel CA Alhambra Independent

New York NY Westsider

Environmental Action
Honolulu HI Advertiser
Bridgeport CT Post
Automotive Industries
School Bus Fleet
Department of Transportation News
Environmental News
Sioux Falls SD Argus Leader
San Francisco CA Examiner
Maysville KY Ledger Independent
Berkeley CA Daily Californian
Chicago IL Tribune
Transport Topics
London UK Sunday Times
Jersey City NJ Journal
American Highways
Motor Transport
Renton WA Record Chronicle
Washington DC Post
Pittsburgh PA Press
Seattle WA Times
Seattle WA Post Intelligence
Modesto CA Bee
Noise Control Report
Transportation USA
St. Louis MO Globe Democrat
Croft Publications

Detroit MI News

Cumberland MD Evening Times

Eugene OR Register Guard

Washington Monitor

Elmira NY Star Gazette and Telegram

Rockford IL Register Republic

New York NY Daily News

Elmira NY Sunday Telegram

Dallas OR Polk County Itemizer Observer

Gastonia NC Gazette

Chelsea MI Standard

Fairfax VA Fairfax Journal

Education Daily

WTHI Radio & TV

Noise Control Vibration and Insulation

Appendix B

LISTING OF ORGANIZATIONS AND INDIVIDUALS TO BE CONTACTED IN INFORMING THE PUBLIC OF THE BENEFITS AND IMPACTS OF THE REGULATION

LISTING OF ORGANIZATIONS AND INDIVIDUALS TO BE CONTACTED IN INFORMING THE PUBLIC OF THE BENEFITS AND IMPACTS OF THE REGULATION

As another step in the Agency's continuing public participation program, an extensive effort is underway to inform the public of the benefits and impacts of the noise emission standards for buses. This effort will include direct mailings of information packets to the major groups affected by the regulation and briefings to selected groups. The list below outlines the groups that are to be contacted in this informative public participation effort.

- Congress
  - Senate
  - House of Representatives
  - Concerned Congressional Committees and Offices
- Interested Federal Agencies
- State and Local Governments
  - State Governors
  - State Attorneys General
  - State Noise/Environmental Offices
  - State and Local Environmental Agency Public Information Directors
  - Mayors of Major Cities
  - County Executives of Major Counties
  - State and Local Government Associations
  - State and Local Departments of Transportation

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Bus Manufacturers

- Bus and Truck Trade and Manufacturing Associations
- Intercity, Transit and Special Use Bus Manufacturers
- School Bus Body Manufacturers
- School Bus Chassis Manufacturers
- Bus Rebuilders
- Bus Component Manufacturers
- School Bus Body Distributors/Dealers

Bus Users

- State Directors of Pupil Transportation
- Chief State School Officers
- School Districts
- National and State PTA's
- Education Associations
- Transportation and Transit Associations
- Bus User Associations
- Bus Transit Properties
- Intercity Bus Companies
- Other Bus Users

Media

- Major Media
- Environmental Trade Media
- Bus and Transportation Trade Media
- State and Local Government Media
- Noise Media
- School Media

International Standards and Environmental Organizations

Labor Organizations

- Bus Operator Employee Unions
- Manufacturing Employee Unions

Commenters to Docket and Public Hearings

Noise/Environmental/Citizens Organizations

Interested Citizens and Organizations
from EPA/ONAC Mailing List

EPA Regional Offices

Libraries

- Major Public Libraries
- State University and State College Libraries

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